NATURE MAGAZINE

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

ONE of the finest opportunities for members of the American Nature Association resident far apart to get together is offered in the Glacier Park Tour. The response to the announcement of the trip has been most enthusiastic and it is probable that by the time this appears the party will be entirely filled. The tours leaving on July 20 and August 10, however, will undoubtedly still have vacancies that far in advance of departure. Full information about the trip will be mailed to any members. It is going to be a wonderful trip.

* * *

At the time of going to press with this issue,—in April,—William L. Finley and Arthur Newton Pack, our president, are in the southwest on another wild life photography expedition. One of the objectives of the "hunt" is to film cougars.

* * *

In many states this spring has seen great progress in the campaign for billboard restriction and the return of the rural highways to the public that pays for them. At the time this is written the Maine Legislature has before it a proposed law establishing a license system for billboards and setting up restrictions and conditions under which licenses may be refused. At the hearing on the bill a large delegation of citizens interested in keeping the highways of the State attractive to the thousands who visit Maine every year actively urged the measure and one of the leading speakers in its favor was Mr. Charles C. Goodrich, president of the B. F. Goodrich Company. Miss Florence A. Paul, chairman of the Maine Committee for Restriction of Outdoor Advertising, was in charge of the support.

* * *

The stand taken by the General Federation of Women's Clubs on restriction of outdoor advertising is identical with that of the American Nature Association. This stand was taken by the Federation at the meeting of its Board of Directors in January, reaffirming its earlier attitude.

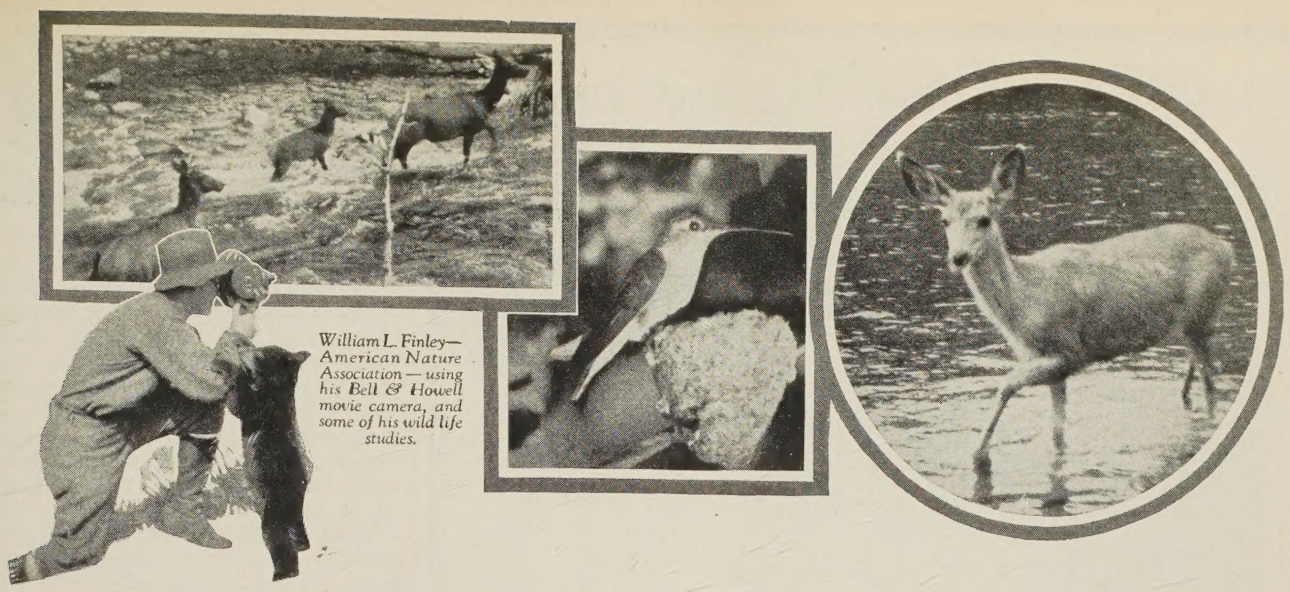
* * *

The successful conclusion of the campaign in support of the measure before the last Congress providing for the acquisition of privately-owned lands in our National Parks, particularly that area in the Yosemite threatened with lumbering, has brought many expressions of satisfaction. E. P. Leavitt, acting superintendent of Yosemite National Park, writing to our president, Mr. Arthur Newton Pack, says: "I am taking this opportunity to thank you for the wonderful assistance and cooperation you rendered personally, and for the help of your friends and associates in securing passage of the bill which authorizes the National Park Service to acquire all of the privately-owned lands and timber in the national Parks. The fine work you all did was largely instrumental in securing the passage of this bill which means so much to Yosemite."

SOLD INTO SLAVERY

HMMM! MAYBE I SHOULDN'T HAVE DONE IT
COME ON KID! I'LL DOLL Y' UP SWELL!"
BILLBOARD ADVERTISING
LAND OWNERS ALONG OUR HIGHWAYS
OUR ROADSIDE BEAUTY
WILLIAM FERGUSON '29

Courtesy Ferguson and Omaha Journal—Stockman



William L. Finley—American Nature Association—using his Bell & Howell movie camera, and some of his wild life studies.

Keep *lasting* records

of your outdoor experiences with FILMO Movies

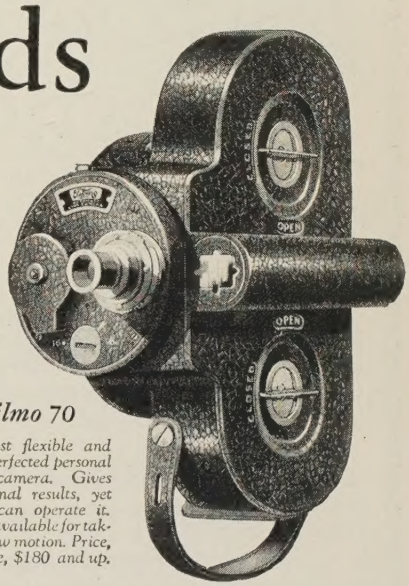
Make your own nature movies when you go camping this summer. The best chances for wild life pictures always occur when least expected. With a Bell & Howell Filmo movie camera you are always ready for the unexpected and the results you get have all the snap and brilliance of professional pictures.

Filmo Cameras are ideal for all outdoor uses. Special lenses and filters are available for Kodacolor and telephoto work and the new Kodacolor-Equipped 57-G Filmo Projector gives the highest quality of color-movie projection ever attained.

For over two decades, Bell & Howell have supplied the professional cinema world with the studio cameras used in producing a majority of the pictures shown in "first run" theaters. Bell & Howell Filmo personal movie equipment is backed by the same manufacturing traditions of precision and accuracy.

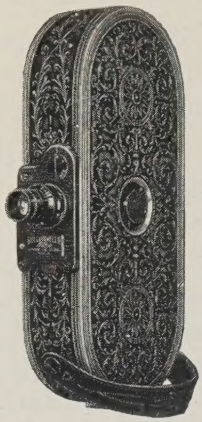
For black and white pictures, Filmo Cameras use Eastman Safety Film (16mm.)—in the yellow box— both regular and panchromatic—obtainable at practically all dealers' handling camera supplies. Filmo Cameras and Filmo Projectors are adaptable, under license from Eastman Kodak Company, for use of Eastman Kodacolor film for home movies in full color. Cost of film covers developing and return postpaid, within the country where processed, ready to show at home or anywhere.

See your nearest Filmo dealer for a demonstration now, or write for booklet "What You See, You Get."



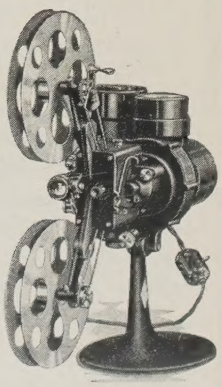
Filmo 70

The most flexible and highly perfected personal movie camera. Gives professional results, yet anyone can operate it. Models available for taking s-l-o-w motion. Price, with case, $180 and up.



Filmo 75

The pocket size movie camera, weighs but 3½ lbs. —comes in Walnut Brown, Ebony Black or Silver Birch. Price, with case, $120.



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Sharp's Latest Book

The Boy's Life of John Burroughs is Dallas Lore Sharp's latest book, and every Nature lover will want to read it. No writer of recent times quite won the hearts of the lovers of the out-of-doors as did John Burroughs. Dallas Lore Sharp counted Burroughs a particular friend, and being himself a Nature writer of high standing, brings to this biography a keen understanding and love of his subject.

"John o' Birds", as Burroughs was familiarly called, wrote about twenty-five books of essays and poems, many of them deemed classics by those who know. From early childhood he allowed nothing to swerve him from the intent to write. All the world—his world—seemed to be against him, but his was the will to conquer and conquer he did, reaching in the last years of his career far beyond his dreams of fame; adored by thousands of school children; acclaimed and fêted by adults. So absorbingly interesting is this wonderful biography of John Burroughs that few readers will care to lay it down before reaching the last page. It is published by the Century Company, 353 Fourth Avenue, New York, price $2.00. R. B. H.

Forestry for the Future

For many years forestry was kept a dark secret. Foresters met together and talked about what should be done, adjourned and wondered at the public indifference to their aims and efforts. Only in isolated instances did it occur to them that something could be accomplished by translating their science and their problems so that the public could understand, and, understanding, give support. The last decade has seen a tremendous awakening. The story of the forest problem has been carried to the schools, clubs, civic organizations, boy and girl groups. The present generation is really beginning to appreciate the issue and, perhaps more important, the next generation is being schooled in the fundamentals of the question. Three million copies of *The Forestry Primer* have been given to the cause through Charles Lathrop Pack and the American Tree Association.

Now the schools are "sold" on forestry education as a part of the curriculum. In response to that demand comes a book entitled *Our Forests, A National Problem*, by Ben J. Rohan. It is a forestry textbook, excellently illustrated, presenting its scheme simply and effectively, using the various textbook devices of tests and collateral reading with discretion and generally constituting a useful volume. It is published by the C. C. Nelson Publishing Company of Appleton, Wisconsin, as one volume in their Exploratory Science Series. We find no statement of its price but this can be obtained from the publishers on the basis of either bulk sale to schools or individual copies. R. W. W.

Do Animals Think?

Alongside of *Are Parents People* and *Why We Behave like Human Beings* in the well-regulated library, there should be *Problems of Instinct and Intelligence,* by Major R. W. G. Hingston, which is a scientific, carefully-written work on the psychological problems of animals, particularly insects. He goes as far as modern science today can go toward answering the question—are animals mere machines?—and has collected data on both sides of the question from all parts of the Oriental tropics. Starting from exact definitions, he tends to prove by preponderance of evidence that creatures long considered "unthinking" beings have, in certain cases, the power to reason from cause to effect, to reflect, to adapt themselves to new conditions, and to remember. Macmillan Company prices the volume at $3.25.

Down Wind

Down wind comes the scent-messages as telegrams of warning or hope to the animals that people the forests and swamps and cliffs, but *Down Wind* came to us as the most delightful Nature book of the year. Donald and Louise Peattie are well known to readers of Nature Magazine as Nature writers who are dramatists at heart and artists in their souls, but in this last book they have unburdened themselves of an inhibition of genius. No human characters appear, nor are the animals given human traits, yet Marga the Gannet, Bufo, the humble toad, and Plutarch are all individuals framed perfectly in their setting. Best of all do Mr. and Mrs. Peattie create a sense of the mystery, beauty and wonder that is in Nature. They are far from sentimentalists, they are scientists first and last, yet they have not become immersed in any one subject so deeply as to lose the sense of relationship and perspective. Primarily they are both stylists, as witness this passage:

"For the marsh knows nothing of pity. Terror it knew, and mother love and mating rapture, and sheer ecstasy, when the dragonflies in intolerable beauty poised over the surface, shimmering on wings of gossamer, tense copper-green and turquoise-blue bodies quivering like the noon heat on the burnished water. Hunger was the driving force of its life, the joy of hunting was a ferocious lust from its dark bottoms to its reedy tops. And it knew cold murder, too."

D. Appleton of New York is the publisher. The price is $2.50. P. F. H.

Real Landscaping

Perhaps the most significant development in recent gardening has been the attempt to "hold the mirror up to Nature"—to make rock gardens that Nature might think her own, fields of flowers rivaling free-growing ones, and groves of trees that add the artistic sense of man to the natural landscaping powers of Mother Earth. Studied carelessness is now the slogan. A book that will help achieve the effect has recently been written by Edith Roberts and Elsa Rehmann, and published by Macmillan, for $2. Its title is *American Plants for American Gardens,* and it points out how to dress up the open field with flowers *au naturel,* how to arrange oak woods, gray birches, the stream side, and other landscape aspects. Handy for the gardener.

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"I am immensely pleased with it —it washes all my small fine things beautifully and I also use it for rinsing them, so I hardly have my hands in the water at all. It is just exactly what I have been looking for, for some time."

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Photographic DEPARTMENT

An important development in the photographic field, particularly with relation to motion picture equipment, comes with the merger of Q. R. S. with the DeVry Corporation. The former organization has been successful in a field closely related to that of motion picture equipment production and only recently entered actively into that industry. The merger places the resources of both organizations together to produce a well-rounded line of apparatus. It is announced that the new company will offer equipment including the whole range of motion picture machinery from the least expensive movie camera retailing at $39.50 to the highest-priced combination talking movie outfits for home and business.

* * *

Anyone who has made amateur movies of his friends showing closeups of portrait character knows that there are always certain frames in the reel where some characteristic and perhaps fleeting expression of the subject is particularly attractive. In order that this frame may be preserved in larger form than the 16 millimeter size it must be enlarged. Bell and Howell have announced an enlarger permitting the making of pictures 2½ by 3¼ direct from the amateur film. Thus, for example, a certain pose or expression of the baby, or of some bird or animal, may be made into a picture which might never be obtained by a still camera.

* * *

Many readers have commented upon the fine wild life pictures in Nature Magazine and wondered how so many could be obtained with such appearance of inexhaustibility. Our Nature pictures come from two sources,—men and women who devote most of their time to wild life photography and amateur photographers with a flair for filming the wild. The majority of the best pictures from the point of view of clarity and sharpness of detail are taken with a Graflex camera. Such photography requires a camera which will serve when speed is demanded and light conditions vary widely, and the Graflex seems to receive the palm.

* * *

Educators will undoubtedly be interested in receiving a copy of *The Story of Eastman Classroom Films*, which is a summary of the manner of preparing and using these educational releases. This department will be glad to have forwarded copies of this booklet to any inquirers.

Used & New Field Glasses

Pocket size prisms in 3½, 4, 5, 6, 7 & 8-power, 3 to 12 oz. weight; $13 to $35. Zeiss, Hensoldt (including "Dialyt"), Mirakel, Busch, Schutz, Lemaire, Alco, Colmont and Megaphos. Galilean or "field glasses" $3 and upward. **Satisfaction guaranteed.** Sent on approval.

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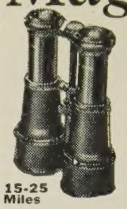
Magic Eyes $7.95



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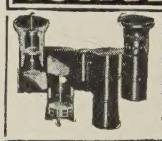

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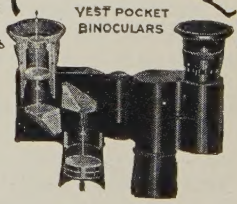

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Tap sticks . . . tap sticks . . . the game is on!

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The Ideal Camp for Girls

Nestled on the shores of a delightfully secluded lake, and in the midst of the picturesque Maine woods, 10 miles from Camden and Rockland.

Land and Water Sports
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Reservations now being made for the season, July 1st-Aug. 26th. Ages 10 to 18 years. For booklet and complete information address
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For Boys 7-17. Separate units, Juniors, Intermediates, Seniors. Mature experienced counselors. Carefully planned diet. Elective daily program suited to the individual boy's needs. Cabins. Horseback riding. Mountain, canoe, and ocean trips. All sports. Shop. Infirmary. *For illustrated booklet write to*
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Eleventh year. Gentile girls. July and August. $250.00. Ages 8-20 years. Booklet. Mr. and Mrs. Harry Davison, 1130 E. Haines St., Philadelphia, Pa.
A PENNSYLVANIA MOUNTAIN CAMP

By virtue of its year-round equable climate, Hawaii has come to be popular as a vacation mecca for travellers in summer as well as in winter. In presenting the leading articles in this issue, the Editorial Department has sought to gather together in one story, longer than is usual, information about the charms and wild life of Hawaii from a varied point of view. It is hoped that the article will call the attention of visitors to these lovely islands to some of their riches not infrequently overlooked. The author, Mr. Crowder, is passenger traffic manager of the Los Angeles Steamship Company, and has a wide interest in and knowledge of his subject, as his article amply proves.

* * *

Bookings for the Glacier Park Tour under the auspices of Nature Magazine are being made with evident appreciation of the opportunity offered. The limited number of members possible on each tour and the specialized character of its objectives has made it unique and desirable. On the trip leaving on August 10 particular stress will be placed on the application to school work of the experiences enjoyed, since there will be a preponderance of educators on this last trip, especially-planned as to date for the convenience of teachers. Many educators are busy during July with summer courses and the Nature Magazine tour offers an excellent vacation compensating for the summer's work.

* * *

So much interest has been displayed by our readers in the series of articles by L. Raymond Talbot,—the fourth of which appears in this issue,—dealing with the birds of Europe as seen by a group of travellers, that the possibility of a personally-conducted tour of this sort might one day be organized. While such a trip is not in immediate contemplation, the Travel Editor of Nature Magazine would appreciate an expression of opinion or interest on the part of readers in such an idea.

* * *

The fascinating story in this issue about the lovely English village in which the famed Gilbert White made his home will undoubtedly cause the change in itinerary of many of our readers who happen to be visiting England this year. If the Travel Department can be of any assistance to these readers in providing information about reaching Selborne and about the country which surrounds it, the Editor hopes there will be no hesitation to call upon him.

* * *

Further with respect to the Nature Magazine Glacier Park Tour, a number of those who are going on the trip plan to continue on to the coast and return East either through Canada or southern United States routes. The trip to Vancouver from Seattle, thence up to Prince Rupert by water and down to Jasper National Park and home by Montreal is a particularly alluring one. This gives opportunity to see Mt. Rainer National Park as well as the lovely Canadian

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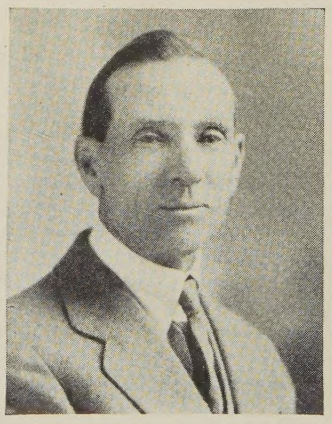

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On February 26, 1929, President Coolidge signed the Act setting aside the Grand Teton National Park in Wyoming. Though relatively small (150 square miles) it is superbly beautiful. Its outstanding scenic feature is the Teton Range, perhaps the most picturesque group of mountains in the country—rugged, yet symmetrical, precipitous and heavily glaciated. Wild animal life—elk, moose, deer, mountain sheep and bear—is abundant in the Park and in the Jackson Hole region to the east, which is a famous dude ranch country. Grand Teton National Park is easily reached via Victor, Idaho, on the Union Pacific System, or from Yellowstone Park, thirty miles to the northward. A combined tour of the two parks is eminently worth while.

* * *

Last year saw a sixty per cent increase in rail travel to Cedar City, Utah, starting point of the Union Pacific motor-bus tour of Zion and Bryce Canyon National Parks in Utah and Grand Canyon National Park (North Rim) in Arizona. The tour also covers Cedar Breaks, Utah, and the deer-inhabited Kaibab National Forest in Arizona. The scenery is absolutely unique in character, unsurpassed in its vivid color and the varied beauty and grandeur of its formations. Transportation facilities and accommodations are excellent.

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In its "See America First" series L. C. Page and Company of Boston has brought out a new and revised edition of *The Lake of the Sky* by George Wharton James and Edith E. Farnsworth. The lake is, of course, lovely Lake Tahoe in California. The volume covers the history of the region, discusses Indian life on its shores and Indian legends surrounding its past, and outlines trips in its vicinity, touching considerably of course upon the flora and fauna found about Lake Tahoe's shore. In short it is a glorified illustrated guide-book to this lovely region. The price is five dollars.

Naturalist Highways

Walk, Look and Listen was written by Raymond T. Fuller for the teacher, the parent or the Nature lover who wishes to know when, where and how Nature can be found. It is filled with interesting observations, varied descriptions, a Pandora's box of plans for Nature work in schools, and numerous stories of animal and plant adventure. Perhaps the chapter on "Birth Control in Birds" is unwise, as it may lead others to make experiments in increasing the laying period of mothers robbed of their eggs; the rest of the book we appreciate and endorse. It is published by the John Day Company, New York, at $2.50.

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C. W. BRENNAN, *Advertising Manager* · HARRY E. RADCLIFFE, *Business Manager* · PAUL F. HANNAH, *Assistant Editor* · GARNET W. JEX, *Assistant Artist*

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NATURE CALENDAR

JUNE

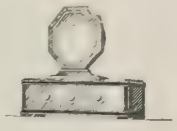
by E. Laurence Palmer

HISTORICALLY June is a month of which we may well be proud. On June 24, 1497, John Cabot landed on the mainland of America, being in all probability the first white man to do so. For his discovery, he received from the king of England a reward of ten pounds. Unlike many pioneers in science, however, Cabot was able to capitalize on his discoveries since he held somewhat of a monopoly on the fishing rights on the Grand Banks. Fishing then must have been much better than it now is, though the means of getting the haul to market were not as good.

Just four hundred years to a month after Cabot saw America for the first time a man by the name of Diesel read a paper describing a new oil burning engine which has since revolutionized ocean travel. Now we find Diesel engines driving fishing boats up and down both coasts of America and elsewhere over the world. Summer tourists will cross the seas in search of new experiences and their comfort will be greatly increased where these engines are a part of the equipment.

Interestingly enough June is the month in which we welcomed to our shores an immigrant who has done much for our comfort on land. In 1889, Steinmetz came to us practically penniless. Before he died he rose to a place of leadership in the field of electrical engineering, doing much to develop hydro-electric power and free our people from the necessity of hard labor for life. One of his most interesting experiments was concerned with the making of artificial lightning, a rather poor imitation of the real thing so common in our June weather. Studying this artificial lightning, however, Steinmetz was able to do much to solve the problem of preventing lightning from damaging the electrical equipment upon which we are now so dependent.

Following a June thunderstorm many of us take to the fields to renew our experiences with our bird friends. Most of them are caring for their young or incubating their eggs at this time of year and permit us to get better pictures of them than is possible at almost any other time. To be sure mosquitoes and blackflies add to our discomfort but they can be avoided. One of the men who has helped us more than anyone else to know our American birds is Frank M. Chapman, whose birthday is June 12. Those who have visited the American Museum of Natural History and seen the habitat groups for which he has been largely responsible can appreciate how much he has done to interest the public in bird life. His books too have been so interestingly written and so well illustrated that they have aroused much public interest in birds. June is one of the best months in which to capitalize this interest and study birds themselves, for it is the nesting time of many.



The air of June will begin to be noisy with sound—the calls for food by young birds, the calls of defiance issued by the adult males of most feathered species, the booming of bullfrogs, and the "stone-rapping" calls of cricket frogs. To these we may well add the first half-hearted calls of crickets and grasshoppers, the determined and persistently annoying hum of mosquitoes, the angry buzz of wasps and the contented hum of honey bees. No doubt the time will come when telephonic instruments will be used extensively in increasing for our study natural noises which we cannot now hear but which reason tells us must exist. It will probably be much more difficult to interpret these sounds than to develop them so that they may be heard by men. We now have equipment which makes it possible for us to take motion pictures of what happens to food during the digestion in our stomachs. What an interesting field lies before us when we can apply our increased ability to hear.

A Lone Sentinel of the Hawaiian Sunset

NATURE MAGAZINE

Volume 13

Number 6

June, 1929

MAE HARA

HAWAII'S MOUNTAIN OF PERPETUAL SNOW

Mauna Kea, on the Island of Hawaii, seen across the Bay of Hilo, even in the distance a great bulk

HAWAII That HAS ALL THINGS

Age Cannot Wither Her, nor Custom Stale Her Infinite Variety

by Roy V. Crowder

WE SPRAWLED out lazily on the sands of Waikiki after leaving the velvet water. The Planter's Moon tangled its golden self in the fronds of the coco palms, and the surf flashed in tiny phosphorescent leaps along the rim of the land. Diamond Head brooded in back of us, peacefully dreaming, perhaps, of the days when it was a volcano, building lava blocks up out of the Pacific. The shimmering, slightly restless sea stretched upwards to touch the descending arc of the stars.

"Wonderful." There was a touch of awe, of reverence, in my friend's whisper. "After all, Hawaii is the best of little things, don't you think?"

"Yes," I answered, and waved my hand toward the

MAY I HAVE THIS DANCE?
Laysan albatrosses on the beach of the Pacific isle

WAIKIKI, THE FAMOUS
In the background is Diamond Head

My friend's words have often come to me when I climbed far above Honolulu through the shimmering green of the Nuuanu Valley to the Pali of Oahu Island, to gaze again over the old crater that now is wrinkled and torn by cliffs and valleys, and whose lava reds are turned to the green of a tropic tangle. I have recalled them when slipping over the quiet waters of Hanalei Bay on Kauai, where myriads of weirdly beautiful fish, as brilliant as if Iris had splashed them with her rainbow at birth, dart beneath the turquoise blue, and where the feathered

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southeast, where I knew the volcanic fires of Mauna Loa and Kilauea were Vulcan forges lighting up the night, and the silver sword plant was blooming in the moonlight in the extinct old crater of Haleakala. "Hawaii, that has all things."

"Hawaii is like Cleopatra," came the slow answer. " 'Age cannot wither her, nor custom stale her infinite variety.' "

Long ago my friend said this, long before air and rail brought Pacific ports within 3 days of New York; and before the world's most isolated group of islands was linked with the mainland by modern luxurious liners; but I recall his remark every time I return to satisfy a longing which I can hardly understand or even analyse.

FISH OF THE TROPIC WATER
One of the many varieties of tropical fish to be found in the waters of the various isands

tufts of the coco palms, sentinels above the coral reefs, alone refrain from joining the riot of the thousand colors as the sun sinks down in the Pacific.

And amid the rice fields in the sculptured Hanapepe Valley, or on the canyon rim of Waimea, more richly tinted than the Grand Canyon, where flocks of white birds stream to and fro silhouetted against the steep ochred walls, or when reclining in the shade of the giant umbrella leaves of the apeape on some mountain slope, I am wont to wonder if anywhere on earth Nature has been so varied. The question is always with me,—along the beautiful highways with their hedges of bougainvillea and pink and white shower trees; into the Iao Valley, that resembles Yosemite in its rugged beauty; up through the tangles of the hau tree to the lava torn slopes of Mauna Loa and Mauna Kea among hundreds of extinct tiny craters that spell out the story of the past; even along the desolate desert stretches of red lava plain on the lee sides of the islands, that are so different from the tropic richness on the northwest.

I like to think that Hawaii is a microcosm in the macrocosm of the earth, that it has everything the whole earth has. But better I like to think of it as the pleasure child of the East and West, born with a golden spoon in its mouth.

A volcanic crack gaped thousands of years ago to fling a great spurt of lava into a bow-shaped mountain range seven miles high. It boiled out of the sea in tiny islands, dotted with volcanoes, that, never resting, continued to build up the land, until each in its turn expired. Ocean currents caressing the shores promised a land that would never be too cool, and the northeastern trades, moisture laden, gave their word that Hawaii, even though on the 19th parallel and really in the tropics, would not suffer from excessive heat. The mountains reared up nearly 14,000 feet from sea-level, offering an unlimited range to the drifting masses of plant life, ocean borne, that came to find a home in the crumbling lava blocks, and insuring climatic diversities for the humans that

THE RED-FOOTED BOOBY ON HER NEST

One of the interesting birds found in the Hawaiian Islands. At the left are the falls of Wailua on Kauai

TAI SINE LOO

BAKER

IN TROPIC JUNGLE

The giant leaves of the apeape dwarf the man seen standing under them

were to follow. The trades, cooled as they struck the ridges, dropped their burden of vapor on the windward slopes to create the luxurious flora that belongs in the rain-belts, and these torrents worked rapidly on the unresisting rock to carve it into steep valleys, cliffs and fluted hills. But on the leeward, a new world was born, for little moisture fell, and dry soil plants,—the night-blooming cereus was one—tried to hide the shameless naked red of the parched volcanic plains. And though the old volcanoes twinkled out, one by one, as their tasks were finished, the youngsters, with the enthusiasm of youth, went forward on the more recent islands, Hawaii and Maui, to create new craters and fire pits and lava flows. The weird sepulchres of the others, lonesome and as beautiful as the craters on the moon, remained to add another facet to the jewel of the Pacific.

The group of islands—there are twenty of them, but only nine, Niihau, Kauai, Oahu (on which is Honolulu), Molokai, Molokini, Lanai, Maui, Kahoolawe and Hawaii, are inhabited,—was first discovered by Juan Gaetano of Spain in 1555, and Captain James Cook, who later left his bones beside its shores, claimed it for England in 1778. He found a highly intelligent race in possession, the descendants of a little band of Polynesians who swept without chart or guide across the Pacific in their out-rider canoes, to take this luxuriant haven. The natives had a well-regulated set of manners and customs, clothes of paper cloth, called *tapa,* a haunting music, and some art. A band of New England missionaries took charge of their souls in 1819, and later the influx of business and other races diminished the stock, mainly through intermarriage, until it is about to disappear. The United States generously offered to bring this naval key to the Pacific under the protection of the eagle in 1898, and as one of the two territories, these islands have continued their economic development to assume the lead in relative production of sugar and pineapples, and to come into a new glory as a tourist's paradise.

LORIN TARR GILL

FLOWERS, BIRD LIFE, SCENERY

The hibiscus at the top, the wedge-tailed shearwater, in the insert, and the stern cliffs of the Pali that rise about the beautiful motor-road typify Hawaiian variety. Many are the varieties of hibiscus that have been developed and that grace the gardens of Honolulu with their striking blooms and varied colors

EDGEWORTH

The old language of the Polynesians contained no word for "weather", for the natives, in their simplicity, could hardly distinguish the temperature change from one season to the other. Perhaps the greatest charm of Hawaii is its climate. In the city of

Honolulu, last year, the thermometer crept up to 86°, and once down to 60°—a range that seems too good to be true to one living in New England, where 95° in summer is followed by 20° below in winter. The rough general Hawaiian average is about 75°, with variations of eight degrees either way. Mountain and sea breezes constantly fan the valleys and the plains. As one climbs into the hills, which on the windward sides of Kaui, Maui and Oahu jut straight up from the sea, each thousand feet drops the temperature about four or five degrees. On the top of Mauna Kea, 13,823 feet high—the loftiest peak of all—zero is sometimes reached, and snow remains for months in the year. The arrangement is almost thermostatic—one can pick just the temperature one wishes!

THE NEEDLE—
A VOLCANIC FREAK

Below is Waimea Canyon, the Grand Canyon of Hawaii, and as rich in color as its Arizonian brother

The steady blowing "trades" are the real climate builders, however, and are largely responsible for the endless variation of plant life. Like an overloaded plane dropping gasoline ballast, they spill their tons of moisture on the windward peaks, but have only a few drops for the parched valleys to the southwest. Awini, on Hawaii, groans beneath the weight of 167.68 inches of rain each year, while Mahukona, nine miles distant, boasts of but 16.6 inches. The slopes of Mt. Waialeale—and well is it named, in the native tongue, "rippling water"—are the wettest of any on earth, for 476 inches fall there yearly, breaking the record of old Cherrapunji, in the Khasi hills of British India, which soaks up a mere 426 inches. Yet

LORIN TARR GILL

THE HAWAIIAN RAT ON A SNAIL DIET

One of the few native mammals, older inhabitants than the Polynesians

within fourteen miles of Waialeale, a weather station records but 22.21 inches in 365 days.

No wonder, with utter dryness and the maximum of wetness, with equable temperature, yet with a range of more than 60° in the average from seacoast to mountain top, that Hawaii has about six hundred species of plants that are found nowhere else on earth, some 860 species spread over 265 genera that are native to the island, and more than one thousand kinds in all!

From the beach sandal wood and the koali, or morning-glory, of the lowlands to the exquisite silver sword plant blooming in its only habitat amid the pigmented walls of Haleakala, there is a beauty and strangeness of plant life that is distinctly Hawaiian. The yellow and white shower trees, the Indian pepper and the banyan, the bougainvillea, hibiscus, oleander, and hundreds of other brilliantly flowering trees or shrubs spread a mantle of loveliness over the city streets and highways; palms, several varieties, lend their romantic atmosphere to the beaches and lowland slopes. The scarlet *Poinciana regia,* the flame tree, burns and flashes everywhere amid the green. Farther up the hillsides, the hau tree, a favorite of the Hawaiians, spreads its shade over arbors or verandas, or works its long, freely-branching arms into impenetrable thickets in tropic recklessness. In the dryer spots, up to an elevation of 1,500 feet, a famous mesquite, the algeroba, the heritage of Father Batchelot, who founded the Roman Catholic mission in Hawaii, clamors for its share of attention. And in the deserts, the awkwardly beautiful night-blooming cereus wakens to the evening breeze.

Even steady cutting has not eliminated the famous Hawaiian koa, "soldier", or mahogany tree, from which the natives made their war and outrider canoes. The ohe, incorrectly labelled a bamboo, climbs the lower ridges beside it; the wiliwili or coral tree adds its note of grace. The lower forest zone includes the kukui tree, the ti plant and the cabbage tree; above them jut the ohia and the brilliant native hibiscus and the smilax, an energetic climber with large stems and leaves; and over the intermediate mountain regions roam the sweet-scented maile vine and the delicate lehua. Even up to where the lava flows have hardly cooled, the crowded plant life boldly ascends.

On Hawaii, which is the newest of all the islands, one can find all the stages of the fern age, from the margins of the Azoic period through the tree ferns, to well-known forms common to the temperate zone. A host of flowering vines bedeck the forests, twining their way like Medusa hair. And as if the natural flower show that is the principal feature of Hawaiian spring was not enough, every cottage, garage and arbor is flanked by native and imported cultivated varieties, to confuse beyond comprehension the color symphony.

Thus have the aesthetic labors of Nature been successful in Hawaii, but even as fortunate has been the partnership which man and Nature worked out to create economic independence for the islands. The pineapple was taken from the rubbish pile in Jamaica, to become one of the most profitable of plants. Hawaii obtains the greatest sugar yield per acre of any land—thanks to the ingenious irrigation systems that cover the lee sides of the islands, and to the heavy rains that water the Northwest. The total crops rise as high as 15,000 pounds to the acre, while Louisiana, America's sugar state, averages only about 2,600 pounds. Great engineering skill and financial nerve are woven in the

BAKER

PINEAPPLES ARE PLANTED IN PAPER

To conserve the moisture necessary for the young plants and to keep weeds down

FLOWER OF THE NIGHT
The night-blooming cereus has become almost a weed, so prolific is it

story of this achievement. There are sugar plantations on Kauai, Oahu and Maui with forty miles of tunnels and ditches to carry life-giving water, and a famous aqueduct on Oahu taps four valleys and traverses a tunnel 14,443 feet long. One plantation uses more water than the city of San Francisco. Thousands of artesian wells dot the countryside. In 1926, about 776,000 tons of sugar worth $65,000,000 were raised on the 6,449 square miles that comprise this daub of water-surrounded land. The pineapple crop brings a revenue of nearly $34,000,000 annually.

One of the most distinctive natives is the papaia, the breakfast fruit nonpareil. It tastes like ripe cantaloupe flavored with a sprinkling of Edam cheese, and is in the class with olives and oysters in that the taste for it must be acquired. It is rich enough in vegetable pepsin to have medicinal properties of real merit, which makes it one of those real tasty edibles which in addition are dietetically innocuous.

SENDA

The epic tale of the struggle of commercial Hawaii to protect its crops against insects and wild plants has not yet found a Homer, nor have the hula girls incorporated it into their medleys; yet the grim fight has been dramatic and intense. Caneborers, and then leaf-hoppers, both of the insect tribe, advanced over the succulent acres, and the call went out for natural enemies to fight them—for insect mercenaries who would fasten themselves parasitically on these two destroyers. After four years of labor, dramatics and patient search, Mr. F. Muir discovered and brought back a parasite for the borer from Amboina in the Molucca Islands. A tiny insect whose sole joy in life is the laying of eggs in leaf hopper's eggs was carefully transported from Australia, and the battle was won. Then came the lantana, transplanted by some trusting soul. It is a beautiful plant in Mexico, but as villainous a cutthroat as ever tried to grab all the land when in Hawaii. A fly was found with a grudge against it—it

WHERE PALMS ARE SENTINELS
Along the perfect highways these plumed sentinels guard the roadsides

laid its eggs in the buds, and the wily band of entomologist-generals, who fight Nature with Nature, scored another victory. Now the fruit fly, committing outrage on 72 varieties of Hawaiian fruit by laying eggs in them, is the object of attention, and four species of parasites that prey on its larvae have been found in Africa and Australia, so soon it may be "pau" (finished) for it. The papaia is not one of the fruit victims, for its pepsin literally digests the eggs.

Not all attempts to rid the islands of unfriendly visitors have been successful, however. The mongoose was introduced to reduce the rat population, but became a problem itself. The beautiful but quarrelsome Japanese mynah bird was invited to worry the leaf-hopper, but instead worried the native and visitor with its discordant song. It marauded throughout the land, plundering eggs and young, and helped eliminate the last of the gorgeous native birds, the iiwi, the oo and the mamo, from whose feathers the natives made their royal costumes. One of its cousins, the Indian mynah, is in the National Zoo in Washington, where it croaks out every few minutes—the mynah is wise enough to talk, but not wise enough to keep still: "How about appropriations?" Which is rather Hawaiian in spirit, for the Congress of the United States has been rather lax of late years.

One misses, in Hawaii, the brilliant-plumaged tropic creatures of southern climes. Either over-specialization of bill, or inadaptability, has driven away most of the exquisite creatures that once inhabited the islands, and many introductions have been made. The Chinese dove, designed for soft moons and lapping waters, the Manchurian thrush of the mountain regions and the Chinese pheasant are favorites. Shore birds crowd in millions to Gardner, Laysan, Midway and other smaller islands in the northwest; the piratical frigate bird, the soft-eyed love terns, that lay their eggs on horizontal limbs and precarious cliffs, the foolish-looking booby birds,—they all are there. Albatrosses do their exquisite dance on Laysan. Several kinds of gulls shriek in thousands along the coral shores. Bird life is abundant even if the color is not so bright or varied.

Wild fowl, pig and dog were brought by the Polynesians, and one or two native bats and a rat greeted them, together with the only reptilians, several species of small lizards. Among the other mammals that have been added are the Japanese spotted deer, domestic goats that have gone wild to roam the mountains, and swine. If the mammals and birds are not well represented at the crossroads of the Pacific, however, the fish are, and to gaze down into the waters of the bays is to see a world that beggars description. Swimming veils of chiffon dart by, flashes of ruby, turquoise, emerald and topaz ripple the surface. The blenny crowds the pools, the striped Moorish idol and the frog fish, a symphony of ugliness, are everywhere, consorting with the quaint puffers, the bristly porcupine fish, and the color-dabbed parrot fish. Gurnards and flying fish follow the steamers in the harbor, and sword fish and sharks cut the water with their huge dorsal fins like sails above the blue. Tarpon furnish sport; the mullet, food; and the dolphin offers both possibilities in addition to a dazzling beauty. Life is one sweet song for the fisherman in Hawaii, or for those with an eye for color.

The mother of Hawaii has been volcanic action, and thousands of cones and dead craters freckle the surface of the islands. Everywhere are bright colored lava blocks, remnants of old vents, "powdered glass," blown-out valleys. Part of the craters are filled in and covered by vegetation, most of them are quiescent, but for centuries to come the chief attraction of Hawaii will be Kilauea and Mauna Loa, among the greatest and most spectacular of all the earth's volcanoes. Mauna Kea and Haleakala, who still show the marks of their revolutionary days, are hardly second in interest. Haleakala, on Maui, and Mauna Loa and Kilauea on Hawaii comprise the Hawaiian National Park, a unique addition to the roster of the nation's playgrounds.

COGGSWELL

AN ANCIENT KOA OR "SOLDIER" TREE

It is the largest species on the islands. Natives made their war and out-rider canoes from its bulk

THE BANYAN TREE WAS BROUGHT YEARS AGO FROM INDIA

Now it is found on all the islands, as one of the principal shade-bringers

COURTESY, LOS ANGELES S. S. CO.

To stand on the rim of the crater of Mauna Loa, nearly 14,000 feet above sea level, and gaze across its great pit, three miles long and one and one half miles wide, from which rise jets of steam, lava fountains, and streams of fire four and five hundred feet high, or to gaze into Halemaumau, the "House of Everlasting Fire", on Kilauea, 4,000 feet above the sea, is to understand dimly the immensity of this little drama of the Pacific. For thousands of years the process of building up has been going on. In 1924 and again in 1926 Mauna Loa gave a demonstration of her construction powers; for two weeks in each case she poured streams of incandescent lava down the mountain sides and into the ocean. The steam column rose so high that thunderstorms formed on top of it, and the sea was littered with boiled fish. In both instances, great strips of land were added to the island where deep seas washed before. Both this volcano and Kilauea are "safe", however; no life has been lost for years; they are "show-off" fire works, ideal for tourist's delight. Near them towers Mauna Kea, the highest peak of all, too dignified now, and too rotund perhaps, to rage and spit fire. Haleakala, with its gigantic crater nineteen miles square, dreams of its former power, on Maui, and rivals the sunshine with the color of its pigmented walls. You never forget these mountains.

Rapidly the gaps between the Hawaiian Islands and the rest of the world are closing up. Seventeen months were needed for the *Thaddeus,* the first missionary ship which sailed in 1819, to cross from New England and return. Now by air and rail you can leave Boston, amid ice and snow, and reach either of the two great ports of California, San Francisco or Los Angeles, in three days. From both of these ports there are regular services of splendid liners which in from four to six days, according to the particular steamship chosen, will land you in Honolulu and you can be eating papaia under the coco palms of the coral pink castle of the Royal Hawaiian Hotel while reading the latest news stories of the last evening's happenings on the mainland. There are also less frequent sailings from the ports of Vancouver, Seattle and Portland. Even when crossing the American continent all the way by rail, Hawaii is but seven to nine days from Chicago or eight to ten days from New York.

One cannot be a malihini, (newcomer), long in Hawaii. The people are kind and friendly; the climate gentle and welcoming. Soon you find that disease that strikes everyone,—love for Hawaii,—creeping upon you. Hawaii that has all things! It is a siren.—Though one that does not destroy—the siren of the Pacific, a pleasure child, born with a golden spoon in its mouth!

A CHILD *of the* OUTDOORS

When Catherine Gribble was four weeks old she was carried in her mother's arms on horseback along the dangerous trail around Cape Perpetua, Oregon. Before she could walk she rode in the knapsack hung on the saddlehorn of her mother's horse. All fourteen of her life's summers have been spent in the woods and mountains.

"On September first", writes her father, John E. Gribble of Crater National Forest, "we left to put the children in school and she cried at having to leave the woods. The next day she handed us the verses into which she had poured her soul's feeling, although never before had she shown any disposition to write verse. Catherine is truly a child of the outdoors, observing many things in the wild life around her that her elders miss." Below is her poem.

TRAIL OF THE LONELY FOREST LOVER

by Catherine Harriet Gribble

It winds and climbs and dips and turns
On mountain ridge, thru canyons deep,
By dew-clear streams, through endless ferns,—
'Tis there I'd sit me down to weep;—

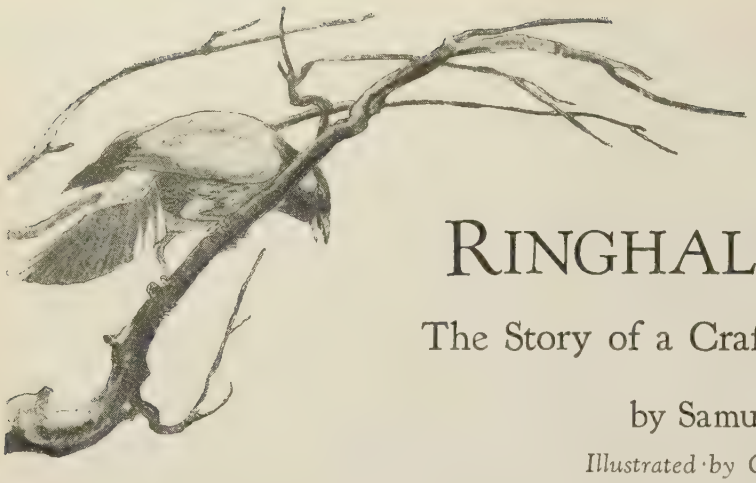
And higher still,—o'er clouds it climbs,
Mid peaks like isles on misty sea,
By mossy rocks, 'neath whispering pines,—
'Tis there my soul still longs to be.

Where mother quail with mournful call
Secludes her babes in silence deep,
Where red deer graze when shadows fall,—
'Tis there I'd lay me down to sleep.

Where yellow pines guard well the trail,
Where bluejays scold, with bristled crest,
And over head the eagles sail,—
There I'd lie down to quiet rest.

Where fawn-fed panther calls its mate,
Mid ghosts of trees in forest burn,
Where lone wolf howls in fear and hate,—
'Tis there my lonely thoughts do turn.

Where broad oaks skirt mountain meadows,
Draped with gray moss by Nature's hand,
Where snow-capped peaks cast evening shadows,—
In thought and dreams on trail I stand.



"FOR A MOMENT GRAY BEAST AND GRAY BIRD STARED AT EACH OTHER AS WELL THEY MIGHT"

RINGHALS *of the* VELD

The Story of a Crafty and Dangerous Snake

by Samuel Scoville, Jr.

Illustrated by Charles Livingston Bull

THE AFRICAN night was full of uncanny voices; the mad, ghastly laughter of hyenas stalking their food, alive or dead; the piercing whistle of eagle owls; the roaring of cock-ostriches on the veld, and the high whinnyings of Burchell zebras. Now and then the fretting note of a hungry leopard, like the grating of a dull saw through wood, stilled for a moment all other sounds. Some of those who spoke were fierce killers but there were others who kept silence that were deadly as death itself.

A white cane rat slipped along a tiny trail made by the pattering feet of hundreds of the lesser folk of the forest. At one point in the path the overhanging leaves of a mimosa bush cast a shadow in the moonlight like a pool of black velvet.

As the little animal passed this patch of darkness, there was the gleam of terrible eyes and the next instant the grooved and hollow fangs of a great snake were imbedded deep in the rodent's soft side. The white rat gave one squeak and dropped dead in his tracks, so instantaneous was the action of the venom of his slayer.

For three days and nights the serpent lay gorged beneath his bush. Then came a day when the sunlight lay like molten lava on the red sand of the veld and out into the glare slowly moved the lurker in the dark ready for another victim.

A rough, dingy black above, a smooth, livid black below, the sun glittered on that white band below its grim head which has given the snake the Boer name of ringhals or ring-neck. The British, however, have named it the spitting cobra—for good and sufficient reasons. The only one of its genus and species, by whatever name it is known, the ringhals is one of the craftiest, fiercest and most dangerous snakes of the world.

As that one came out from under his bush he was confronted by a tiny human figure scarcely four feet high. The pale yellow skin, gaunt frame, and scanty hair growing in pepper-corn tufts marked the little native as a Bushman, one of that strange race of tiny hunters who go back to the Stone Age and still people some of the wildest and most desolate stretches of South Africa. The British have known them well.

That one was evidently on a hunt for snake-venom to use in making the arrow-poison on which the Bushmen rely, for he carried in one hand a forked stick and in the other a bark dish.

At the sight of the little man the cobra drove the air out of its single lung with a fierce hiss, reared its black body two feet from the ground, and swaying back and forth waited for a chance to strike.

Keeping a safe distance from the menacing figure, the little hunter began to walk around the snake, while the ringhals swung around so as to face its antagonist, its devilish, black eyes glittering like glass above its swollen hood.

Faster and faster the native circled the serpent, which continually turned to meet him, until exhausted by the unaccustomed motion, the cobra suddenly wavered and fell flat upon the sand. Instantly the Bush-

man sprang forward and with a quick motion pinned the hooded head to the ground with his forked stick. As he did so the ringhals writhed feebly and then the taut body suddenly went limp as if the snake's spine were broken. At the sight the little man somewhat relaxed his vigilance as he stooped down to place between the gaping jaws the bark cup into which he intended to press a spoonful of fatal venom from the sacs of the snake's hollow fangs.

Unaccustomed to ringhals' ways, the little hunter did not know that the feigning of death was but one of the crafty serpent's wiles and that behind the transparent scales, which with snakes take the place of eyelids, the cobra's unwinking eyes were watching his every movement.

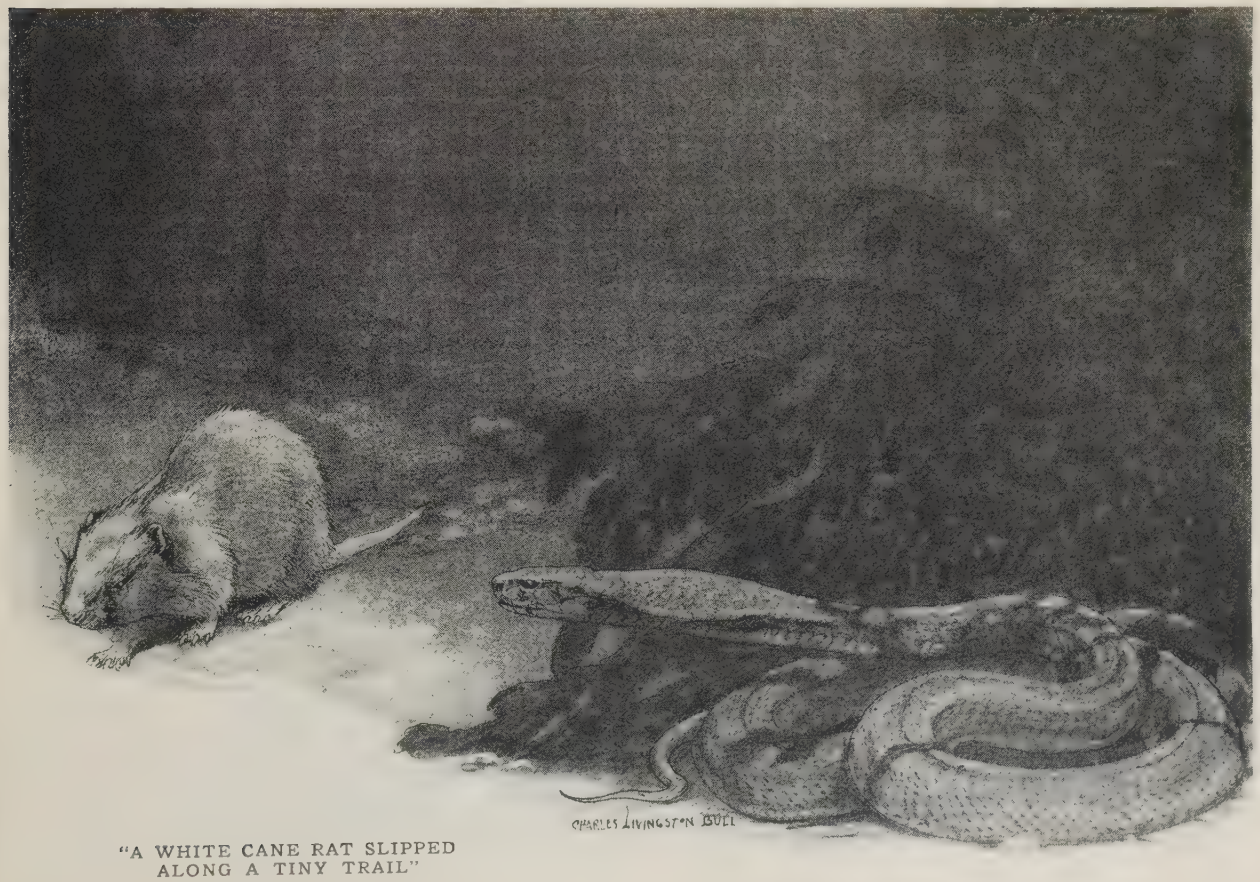
Little by little the distended ribs of the hood relaxed. Then, as the Bushman bent toward the apparently lifeless body, with a sudden movement the snake drew its deflated neck through the crotch of the stick and rearing aloft, jerked its head downward. Instantly two thin streams of pale-gold venom shot through the air straight into the man's face, a little of the corrosive spray finding its way into both of his eyes. With a shout of pain the blinded Bushman dropped pan and stick and dashed away for the nearest water-hole to ease the agony caused by the touch of the deadly fluid.

For a moment the ringhals stayed erect as if watching the retreat of his enemy. As he swayed in the sunlight the gleam of his white collar attracted the attention of a gray bird about the size of a starling which was flitting here and there across the veld, alighting now and then on a bush but never staying long in one place. Two or three times it circled the snake and then flew away nor stopped its flight until it met a beast gray above and black beneath, with a round earless head, black face and enormous claws, who was hunting across the veld, singing a little hissing song through a set of tigerlike teeth.

At the sight of that animal the bird alighted on a near-by bush and chirped loudly. For a moment gray beast and gray bird stared at each other as well they might, for the bird was a honey guide and the beast a honey-ratel and for a million years or so honey guides and honey-ratels have had a partnership agreement together. The bird leads the ratel to a wild bee's nest and he pulls it down and devours the honey, leaving the grubs of the immature bees to the bird. Sometimes, however, the honey guide, who is a strange, perverse parasite, laying her eggs in other birds' nests, like the European cuckoo and the American cowbird, will lead her unsuspecting partner to where a venomous snake is coiled or a sleeping leopard couched.

So it was that day. Chirping loudly the bird flitted along just ahead of the ratel, who followed her across the veld straight to the spot where the ringhals lay coiled up again beneath its bush, after its encounter with the Bushman.

At the first sight of the ratel's round head, the dark snake reared itself aloft. The ratel showed no surprise at finding a deadly serpent instead of a store of honey. After all, cobras to him were just so many feet of food and he had special reasons that day for obtaining as much food as possible—four round chubby ones curled up in a grass-lined burrow beneath a wild-fig tree. Accordingly with a little clicking chuckle he rolled forward like a baby-tank, bent on causing destruction.



"A WHITE CANE RAT SLIPPED ALONG A TINY TRAIL"

As he came within range the great snake again jerked its head downwards, shooting the deadly jets of venom through the air directly at the ratel's eyes. That animal, however, unlike the Bushman, was well acquainted with the ways of spitting cobras and at the first motion of that one's head, dropped his own until his eyes were shielded by his forelegs and trundling in with his eyes always protected, gripped the ringhal's body just below the hood. Again and again the snake struck, hissing fiercely until the ratel's neck and back were all bedewed with the yellow venom but never once could its short fangs pierce the thick wiry hair of its opponent.

Slowly, inexorably, the grinding, cutting teeth of the ratel cut through the black skin and steely muscles of the snake until as they met in the serpent's spine the black body went suddenly limp and lifeless.

That day four little ratel cubs fed full on the flesh of him whom they know as the deadliest snake of the veld.

An Invisible Mushroom

Hide and Seek Is the Game Trumpet Mushrooms Play

By G. G. Nearing

How can a mushroom grow above the ground in plain sight, and yet be invisible? To be truthful, invisible is not the right word to use, but you would use it yourself after your first attempt to pick the trumpet mushroom. It is really a case of camouflage.

You may have looked straight at the trumpet a hundred times and never once seen it, or if you have unusually keen eyes and an observing nature, you may perhaps see one for every ten you look at.

Trumpet mushrooms grow by the thousand under beech trees during hot wet summer weather. If you know the ground it is often easy to gather a peck in half an hour. But no amount of experience will enable you to see them without a special search.

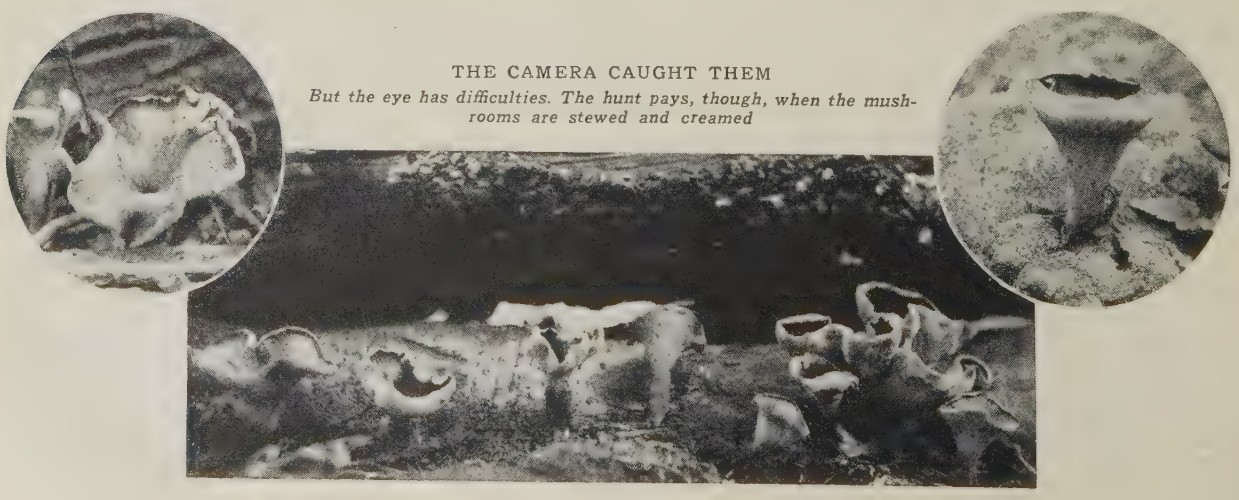
The reason for this "invisibility" is not far to seek. It is largely protective coloration. Yet to look at an individual mushroom in your hand, you would probably not consider the color particularly good for that purpose. Or to put it another way, if you were asked to color such a thing protectively, you would not be likely to choose the same color.

The cause of its invisibility, however, is the ground it grows on. This is usually a bare spot where the dead leaves have mostly blown away. The soil will be quite black after a rain, but light gray or brown in dry weather. Twigs hoary with lichen growth or even lichen incrustation on the ground only add difficulties for your eye. The mushroom fades into the background. The color at the start is very dark sepia, or, in wet weather, black. It may change to an oak-leaf brown or remain black, shading to grizzly gray toward the margin. In dry weather the inside may grow pale gray or brown.

The trumpet mushroom, *Craterellus cornucopioides*, is shaped something like a little crumpled tin horn. When young and only an inch high it has usually a perfect trumpet shape, but growing larger the edges begin to curl or grow wavy. In five or six days it may reach a height of four or five inches with complicated wrinkles and folds, losing all resemblance to a horn.

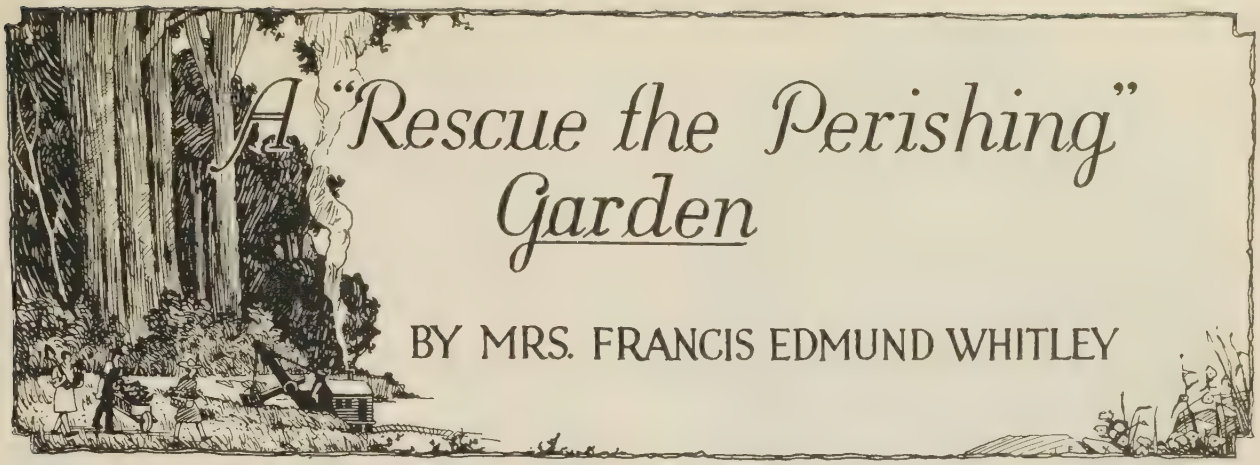
As the trumpet mushroom is one of the most delicious and at the same time one of the safest of fungi, its habit of camouflage is endlessly exasperating. You pick out a likely spot under a beech tree above the stream bank, where patches of bare ground show. A glance shows no trumpet mushrooms. But wise to the hiding habit, you lay down your basket and lean over so as to bring some of the ground in silhouette. Sure enough, you see one. You pick up your basket again, only to discover that you have set it upon a dozen.

If trumpets are stewed and creamed they will take forty or fifty minutes to develop the best flavor. The cooking must be slowly done in a covered kettle. The white sauce should be thick. If you hit upon just the right way to cook them you will have an unforgettable dish. Even half a dozen will add a wondrous flavor to a stew, or make a pot roast fit for a king.



THE CAMERA CAUGHT THEM

But the eye has difficulties. The hunt pays, though, when the mushrooms are stewed and creamed



A "Rescue the Perishing" Garden

BY MRS. FRANCIS EDMUND WHITLEY

One who year after year eagerly studies the garden magazines and finds the annual output of seed catalogues more fascinating than any "best seller" notes many new fashions in flowers. Few are more noticeable than the increasingly large place given to the wild flowers. Under the appealing heading for the section devoted to perennials,—"Flowers That Our Grandmothers Loved",—a popular catalogue lists the names of wildings which grandmother would have been much surprised to see among the aristocrats of her garden. Our garden magazines and popular journals abound in articles on "Wild Flowers for the Rock Garden", "A Wild Flower Corner" and such, while the advertising columns offer plants and seeds of these flowers.

What has brought about this change? Is it because as they grow more rare we long to cherish and keep them? Or is it because since some of the landscape architects have made such effective use of native plants and shrubs, our eyes are suddenly open to their beauty?

Yet a disquieting thought comes as we read—where do they come from, all these ferns and wild flowers for use in our gardens? Where will be that last touch of loveliness which they give to the out-of-doors when, filled with this new appreciation, the public fares forth to "bring from the nearest woods", as we are blithely advised to do, the plants needed for a new wild flower corner?

If only we might hope that transplanting them thus would not spell sudden or gradual death! If only those who want "a bit of Nature" in the backyard would study habitat and soil before they take the little victims from their homes to perish as martyrs to ignorance! As we view the proudly displayed plot where delicate ferns and their flower neighbors are set in heavy clay, perhaps, or in the blazing sun, "Hail and farewell!" we murmur inwardly, for we know that we shall not see them next spring.

The thought of all these sacrifices would almost make one regret the newly-awakened appreciation of wild flowers, were there not some alleviating considerations: one, that study of their native conditions is becoming more general and can be encouraged until more of these involuntary little pilgrims may find themselves comfortable after moving; the other is that with the increase of population, the advance of agriculture and nation-wide construction of highways, many of them must die if left alone.

It is in rescuing these "about to die" that the real flower-lover can often add new beauty and interest to the garden without any haunting feeling of guilt. And then the joy of finding for each an appropriate home, of seeing them grow and multiply as though grateful for such care, and often showing more luxuriant growth than when in their native haunts!

CORNELIA CLARKE

THROW OUT THE LIFELINE

Perhaps this bloodroot, blossoming demurely at the base of a mossy tree trunk, may reach a well-kept garden

Motoring in the country one day, we found boltonia growing where the road graders were just beginning their destructive though, of course, necessary, work. A quick trip after a spade and basket—and several roots found their way to a garden where they have grown far taller than when we found them and have increased until other gardens have shared in their bounty. Nothing could be more charming than the combination of larger flowers,—such as lilies,—with the graceful sprays of snowy blossoms of these rescued.

CORNELIA CLARKE

THE DUTCHMAN'S BREECHES
When the steam shovel or the axe or plow threatens, then is the time to rescue this plant, to preserve it

It was another road-construction project which gave us some of the hardy asters which beautify the autumn garden. Often these repay cultivation with a growth so vigorous and individual flowers of such size as to rival the imported varieties. One in a neighbor's garden grew to such proportions that with its branches laden with the great panicles of soft blue it resembled the wild lilacs on the steep California mountain-slopes. A clump of a larger-flowered variety of a lovely periwinkle-blue was enchanting, growing by a clump of pale shell-pink zinnias; incidentally it may be confessed that the last time this same effect was sought, the asters did their part but the zinnias turned out to be a depressing dirty magenta! Thus, providentially no doubt, the gardener is kept from growing proud and over-confident.

SAVED FROM ROAD-GRADERS
It was grateful, this boltonia, and so grew more luxuriantly than on the roadside

The white snake-root, *Eupatorium ageratoides,* is another native plant which takes kindly to cultivation; indeed so generously does it scatter its feathery seeds that it risks the fate of Tennyson's flower with the "crown of light" which grew till

"all the people cried
Splendid is the flower!"

and then when it became so common all might have the seed,

"Now again the people
Call it but a weed."

Yet with some restraint it is a real addition to the shady corners where not many flowers bloom as late in the season and, tucked away in the borders, it may be forgotten till some day in late August it displays its snowy blossoms among the branches of spiraea or viburnum. I saw it growing with fine effect with its relative the joe-pye-weed, and very attractively, especially when planted in masses, with its vigorous growth and feathery smoky-pink flowers.

It is interesting to remember that in the Eupatorium family the joe-pye-weed takes its name from the old Indian doctor who used it for fevers; the boneset, another cousin, was a stand-by in the old days, when the infusion from its bitter, oh, *how* bitter! leaves was supposed to have marvellous healing powers, while the lovely white relative with its ageratum-like flowers is considered by the farmer so harmful to the stock that eat it that he is glad to see it dug up.

Some experiments with wild gardens prove disappointing because it has not been understood that as a rule they are not particularly showy, at least not for any great length of time. The shy loveliness of most early spring flowers, the trillium, the hepatica, is for the real lover, not for the one who asks only display.

Yet some of the wild flowers are capable of striking color effects; a sheet of the lovely mertensia beneath a blossoming wild plum tree can give as keen delight as the blue squills and cherry tree of which Sara Teasdale writes:

"the blue flame of the flower
And the white flame of the tree."

And was there ever a more arrestingly beautiful combination than the soft clear rose of the Clara Butt tulips with the shimmering lilac-blue of the wild blue phlox?

This phlox, *P. divaricata,* is, of all the rescued wildings in our garden, perhaps the favorite not only for its pure loveliness but for its obliging way of spreading itself through the borders and staying with us. It was nearly thirty years ago that we learned one May morning that a tract of forest not far away was being cleared, that a shady retreat for wild life was to be turned into plowed land. Prompt action followed and oh, the treasures that we brought back—maiden-hair ferns trembling beneath the hot sun, Solomon's seal, hepatica, bloodroot, clematis and best of all, perhaps, some of the silky-petalled phlox, rescued from among the felled trees. Shaded or partly shaded spots in the garden were sought out and the soil was prepared; leaf-mould was brought, a little more sand for some places, and the

flowers have lived and flourished; they and their children are still the best loved part of the garden.

Never once in all these years has April come that the same hepatica did not hold up, through the dead leaves, its bouquet of dainty blossoms like a salutation to the spring. Punctually the shining white bloodroot flowers appear like a flock of little butterflies. Each spring the jack-in-the-pulpit and its descendants unfurl their green and brown umbrellas and the children call out:

"Jack-in-the-pulpit is preaching today!"

The clematis that we brought home, the "virgin's bower," seeds so freely that it would roam all over the place if unchecked; still when its snowy blossoms foam white over the arch at the back gate we forgive it, especially since it makes such a picture with the tall golden-rod that clusters about its feet. But no vine rescued from clearings can surpass the bittersweet, glowing like a sunset in the fall, clean-growing and graceful always.

One native flower which must satisfy the most color-hungry is the butterfly-weed, *Asclepias tuberosa*, which glorifies some dry bank or field in the hot days of summer. This, like the boltonia or blue phlox, is now offered in every catalogue. Few gardens, however, can give it such a setting as when along the banks of the railroad right of way—the wild flowers' last stand—it flames from a tangled background of tall grasses with perhaps the pale candelabra of the white veronica growing near in splendid freedom. This luxuriance of the wide-ranging veronica in such situations is more noteworthy, since it is listed, and is, sometimes, a woods-loving plant. Perhaps it is like those sturdy souls who can do well almost anywhere if only they can be let alone.

The violets who are grateful for being rescued from the road-makers' crew deserve the whole chapter—the downy yellow violets, the bird's-foot and the rest. Perhaps our favorite is the white violet, *V. canadensis*, which seeds profusely and soon establishes a new colony. A plot by the back door gives a fresh picture every morning as the blossoms, of white tinted with purple, continue to appear all summer.

Another native plant listed among the perennials in the catalogues is the *Euphorbia corollata* or flowering spurge, whose delicate beauty deserves a more poetic name. Like the gypsophila, its great branching sprays of tiny white flowers furnish a graceful setting for groups of larger, stiffer flowers. It has been interesting to watch its gradual advance across eastern Iowa and Illinois, following the roads wherever it finds congenial sandy soil. Many native plants with inconspicuous flowers are highly desirable for the gentle grace of foliage and form which makes it possible to combine them in charming groups; the tall meadow rue even without its flowers makes an ideal background for low-growing violets or daisies; wild ginger, *Asarum canadense*, with its thick heart-shaped leaves is most effective growing with tall ferns or Solomon's seal, though its odd flowers hide themselves in the tame life as in the wild.

MASSES OF JOE-PYE-WEED ARE EFFECTIVE IN THE WILD FLOWER GARDEN

Frequently such flowers will die or become stunted, but this is because native conditions of light, temperature, water and soil are not met. Soil-testing devices will help to prevent their deaths

Most of us have sometimes wished that we might "eat our cake and have it, too." Here is a plan by which one may almost realize that wish: to love the flowers of field and forest so sincerely that you mourn over their lessening numbers and hesitate to take even one from its home—then to find yourself justified in their possession in order to save their lives,—this is real satisfaction.

All over the country, miles and miles of highways are being constructed, square corners are turned into sweeping curves, more direct routes cut across woods and fields. Every year hitherto untouched woodlands are being cleared or opened for grazing. It is the price exacted by changing conditions. Watch for opportunities like these to rescue flowers and shrubs otherwise doomed to die; study their needs and give them a home as much as possible like the one that was taken to supply the needs of man.

To do this it is not always enough to secure the degree of light and shade and moisture to which they are ac-

L. W. BROWNELL

VIRGINIA COWSLIP IS AMONG THE MOST BEAUTIFUL

A wild garden may not last as long as a cultivated one, but its charm is as great

customed; the chemical character of the soil where they thrive must be considered: is it acid, alkaline or neutral? Does it need lime or perhaps a peat mulch? Fortunately for the many of us who have more interest in the subject than scientific training, the way has been made easier by the work of men like Dr. Edgar Wherry of the Bureau of Chemistry at Washington. He has prepared a list of plants with their soil preferences and also suggests practical methods of modifying the soil when necessary to meet their needs. Write the Home and Garden Department of Nature Magazine, for information as to these lists and as to the convenient soil-testing outfits.

When wild flowers can only be secured through dealers, do shun the irresponsible vendors, the florists who have no stock from which to fill your orders except as they go out into someone's cherished woodlands and, as so frequently happens, recklessly tear out ferns and plants leaving the place looking like devastated France. There are dealers who regularly propagate the native plants most in demand, just as they might raise dahlias; these usually advertise in reputable magazines and their standing and resources may be ascertained. Do not let us buy so carelessly as to make vandalism profitable.

If in the shelter of our gardens, or in a wild life sanctuary, we can preserve some of these wild flowers, we shall not only add new charm to our bit of the out-of-doors but we shall have the joy of knowing that we have saved for the children of the future at least a little of the marvellous heritage of beauty which Nature has so generously bestowed upon our land.

Vacations and Wild Cats

Vacation time is almost upon us and soon many will be departing for shore or camp in the woods or by the lake. Home will be closed for the summer. Only too often all members of the family do not go along and left behind is a casual cat or two, possibly attached by sufferance to the household and not officially and affectionately adopted. The cat is left behind on the theory that it will make out well enough for itself. It does just this, and Howard Taylor Middleton has pictured in a story without words below what happens when kitty is left to forage for itself. It takes a very short time for the purring house cat to revert to the wild when hunger gnaws, and the thoughtless leaving behind of the family feline often means the deaths of many song-birds and their young families. Take kitty with you or park her where she will be fed and cared for.

J. EABERELL

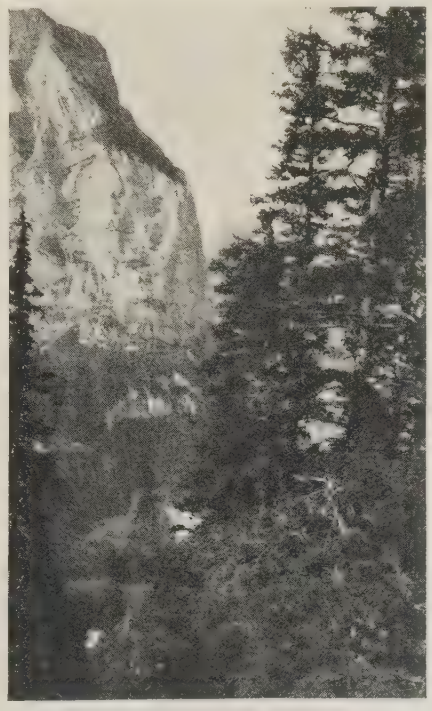
INTERLAKEN means the Jungfrau. "Between lakes" is what it really denotes (remember how we used to struggle over denotation and connotation), and that describes the town accurately. But somehow, the two lakes between which Interlaken nestles, lovely as they are, cannot compete with the pure white mass of snow-covered mountain up the valley just beyond and between the nearer mountains which stand like sentinels over the meadows. So the word *connotes* Jungfrau and to everyone who has ever been in Interlaken comes the memory of that majestic peak which calls and beckons to us wherever we go in this little town.

We walk up and down the one main street; we are fascinated by the hundreds of pretty things in carved wood; we wish we might take them all home and then we wonder what in the world we should do with them if we did! The carved ivory chamois and flowers and William Tells also attract us.

But our attention wanders from shop windows. We look again across the plain toward the Jungfrau, even more enticing now perhaps in the twilight, with a bit of alpenglow. We listen to the splendid orchestra concerts. Between numbers we walk in the garden and look toward the Jungfrau. There is no escaping it, and surely no reasonable person would escape it if he could. It is what one comes here for.

To us bird lovers Interlaken means flycatchers. We had never seen so many. We recognized them readily enough. They perch on a wire or post or conspicuous branch, just as our familiar phoebe and chebec do, and dart out into the air to catch insects, then return, often to the exact spot from which they started. These European spotted flycatchers flit their tails, also, and they look much like phoebes, brown and gray birds.

THIS is one of the series of articles written by Mr. Talbot describing those birds found on his recent European trip. This month you will climb over the Jungfrau and skirt Alpine lakes with him, hunting for choughs and citrils and accentors.



MAN-SIZED MOUNTAINS
This is the view from Wengernalp, where Alpine choughs may be found

But the Jungfrau beckoned. Before many days we felt that we must go nearer. The view from Interlaken was, after all, tantalizing, for we knew that beyond those dark, fir-clad sentinels in the foreground were other snow-covered giants, and that this whole magnificent Jungfrau group must be vastly finer seen from some point farther up the valley.

So we went to Lauterbrunnen, at the very foot of the Jungfrau, then almost straight up into the air by the funicular, over the mountain side, and on by trolley four miles to Mürren. What a marvelous panorama lay before us there! We were speechless. Interlaken, for all its attractiveness, paled into insignificance. Here at last we were really among the mountains. It seemed as if we had only to stretch out our hands to touch that stupendous mass of the Jungfrau, with its flanking Eiger and Mönch and Breithorn and the rest, rising abruptly across the Lauterbrunnen valley, lying a thousand feet below us.

No need to climb further to see the Alps, we said. Yet we knew

LAUTERBRUNNEN VALLEY
On Mürren's cliffs, at the right, goldfinches, linnets, citrils and pipits add their harmonies to the bird medley

PERCHED FOR A SONG
One of the European cousins of chickadee becomes lyrical

J. EABERELL

that grander, more sublime views awaited us on the peaks behind the tiny village. And we did climb; Schilthorn, a truly noble peak 9754 feet high, drew us one day. Allmendhubel is an absurdly easy climb, with its broad, almost boulevard-like path and with benches every few yards to tempt the weary and the overfed. But really, going even a few hundred feet higher means a broader, vaster panorama, and Allmendhubel, though only 943 feet above Mürren, is worth climbing.

At Mürren for the first time we saw a crow with straw-yellow bill and coral-red feet. And not only one, but a flock of about seventy-five. Alpine choughs, as these queer "crows" are called, are fairly abundant in the Alps; one is almost sure to see them on any of the lesser peaks.

The "caw" of this bird has a general family resemblance to that of our ubiquitous, much-loved, or cursed, American crow and the European carrion crow. Still it is enough different to attract one's attention to the flock of somewhat less stocky birds hovering around the tops of mountains.

Our yellow-billed bird has a cousin, the real chough, whose bill is red like his feet. This is the Cornish chough, formerly abundant on the coast of Cornwall. Now it is almost extinct because of stupid, short-sighted persecution. I have never seen one in the Alps, but it is barely possible that there are a few, so it is worth while to look carefully at the bill of every one of these birds.

Mürren is one of the choicest spots in Switzerland. Behind the village are meadows gay with myriads of flowers. Here we found many seed-eating birds, some of which showed gold in their wings as they flew. They sang like our American goldfinches; European goldfinches, we knew. The linnet reminded us of our purple finch.

Mingled with the songs of linnets and goldfinches was a sweet tinkle, one of the most fascinating bird songs we had heard in Europe, though as music it would probably not rank with the blackbird's or the nightingale's notes. When we saw the bird we were sure it was a citril finch. *Citril* is from the same stem as *citron,* which means lemon in French. That is all one needs to know about this finch's plumage: he is lemon-colored,—though that means an *unripe* lemon, for the bird is lemon-*green,* not really yellow. We had read about these birds and seen their pictures, and several times we had thought we had a citril, when we were looking at an ordinary greenfinch. For the greenfinch is abundant almost everywhere. But now that we actually did see a citril finch there could be no mistake.

The greenfinch is stocky; his way of moving and feeding is slow and heavy. The citril is just the reverse —he is as light as the proverbial feather and quick as a flash. Besides, the greenfinch is almost a blue green, quite different from this exquisite lemon-yellow-green fairy-like bird.

Another oft-repeated note in these meadows above Mürren was a sort of *tsee-tseep,* which we knew must come from a pipit. It was much like the call of our American pipits, so abundant along the seashore in the autumn.

These were water pipits, as they are called. Alpine or mountain pipit would be a better name, for "water pipit" suggests that the bird is found along streams or lakes, which is not at all true. To be sure, the hillsides which he likes are almost always wet and soggy; but after all, Alpine pastures usually are moist, so perhaps he has no choice. We had no trouble finding him.

ZERMATT AND MATTERHORN
A paradise for the bird lover. You will see songsters you have only read about in this region

A COMMON SIGHT
The titmouse may easily be found in the valleys amid the Alps

J. LABERLLL

One morning we got up early to see the sun rise, and walked along the footpath which follows the trolley line east from Mürren. The spruces proved to be a splendid place for many kinds of birds. Every few steps we heard a lisp which betrayed the presence of goldcrests and tits.

We returned to Lauterbrunnen, then went up over Wengernalp to Kleine Scheidegg, even nearer the Jungfrau than Mürren. Some of us went up just a little higher, to the top of Lauberhorn, 8,120 feet above the sea; an easy climb if one does not hurry. On the way we saw a pair of snow buntings. Yes, the same snowbirds which are on our beaches and sand dunes in winter. This is one of the few birds found on both sides of the ocean. He is a circumpolar ranger.

Just as we reached the top a small bird dropped down hundreds of feet over the face of the cliff. He had evidently been on the very edge, ready to disappear if any one disturbed his solitude. We felt a little vexed at first; it was the old story,—a bird right before our eyes, not fifty feet away, yet we had missed him until he flashed out of sight. But by looking cautiously we finally located him on the rocks far below. He puzzled us for a moment, but someone saw a resemblance to the hedge sparrow and that gave us the clue we needed—it was his first cousin, an Alpine accentor. Accentors are not at all common, at least in the most frequented parts of the Alps.

Of course we went to Lucerne. A trip to Switzerland without Lucerne and its marvelous mountain-girt lake would be hardly worth mentioning. Here, as everywhere else in this country of high mountains and lakes, the scenery is the real attraction. Rigi looms up a few miles away, not a very high mountain, as Alpine peaks go, but so located that it commands an unusually fine view, even for this land of matchless views. Behind the town rises Pilatus. And one clear day, we were favored with a glimpse of Eiger and Finsteraarhorn, the highest peak in the Bernese Highlands, towering above all the lesser, greener mountains, far away, yet distinctly outlined against the morning sky.

Lucerne has a history, and we enjoyed prowling around in the old city. Of course, we crossed the covered bridges, with their curious paintings on wood that depict historical scenes. We recalled that Elsa and the Prince, in Longfellow's "Golden Legend", crossed the bridge farther down stream. Here was real romance.

The tower of the other covered bridge, in the center of the city, where the lake narrows down and again becomes the River Reuss, is a familiar landmark. There we saw many swifts, only among them were larger ones, white below, with a brownish band across the breast. They seemed to fly faster than the ordinary ones, and there is nothing slow about them!

These were Alpine swifts. As we thought it over afterwards, when we had left Switzerland, we realized that Lucerne was the only place where we saw any, but they were fairly numerous there. And an English authority on birds whose acquaintance we made later, says he never fails to find them around that old tower. To him, they are one of the fixtures of Lucerne.

We fell in love with Montreux—with the town itself, the lake shore, the mountain slopes behind the village, and with the Castle of Chillon with all its associations, literary and historical. Most especially we liked the great plain above Chillon and tiny Villeneuve, where the Rhone broadens out to form Lake Geneva and where the Dent du Midi and the Alps of Savoy look down upon the bluest of blue waters. As we live over

THE OLD TOWER IN LUCERNE
Here Alpine swifts congregate in large numbers

now in memory our weeks in the Alps, this region seems one of the most beautiful of all.

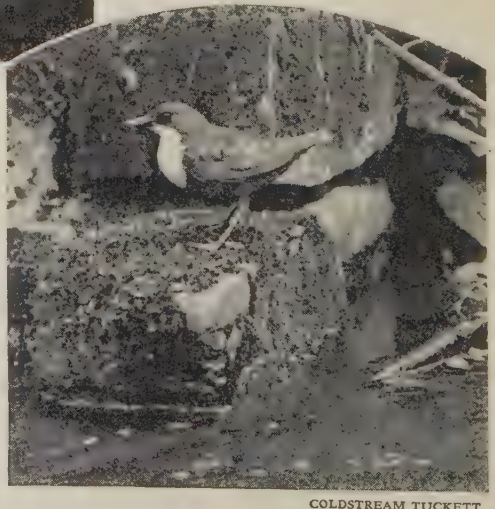
In Byron's poem about the Castle of Chillon, when Bonnivard looked out over the lake from his prison "the eagle rode the rising blast". Now Byron may have been right in calling those great soaring birds eagles; that was many years ago, when even the Alps and Lake Geneva were wilder than they are today. And golden eagles are occasionally seen now away up near the tops of the mountains. We saw one on the Grimsel Pass, that wildest, bleakest of all the high places that we visited. But I suspect that the birds Bonnivard saw were buzzards. For we saw many above Montreux,

EUROPEAN GOLDFINCHES
They sing like the American variety, and are everywhere about Mürren

soaring high, then swooping close to the surface of the lake. Buzzards are the buteo hawks of Europe; that is, they belong to the same group as our red-shouldered and red-tailed hawks. They are plain brownish birds, but unmistakable because of their size, their manner of flying, and their wide-extended wings.

After we had done our duty by the Castle of Chillon we walked along the shore to the very head of the lake, then out onto the marsh. One member of our party, who had been here before, promised to show us coots and great crested grebes,—"And", he added, "I think we shall see little bitterns and sedge warblers". He kept his promise; or rather the birds

ALONG FAST WATERS
The rushing rivers and gorges near the Via Mala shelter water ouzels



COLDSTREAM TUCKETT

J. EABERELL

SILBERHORN IN THE JUNGFRAU
Chamois play in the snow here, and citril finches dart over the meadows. The bird lover and the climber can find no better place

kept it for him. There they were, all four, in the order in which he had named them, waiting to be listed as fast as we could write. It was almost uncanny!

Grebes are grebes, the world over, and we knew those beautiful, great crested grebes, with their brilliant plumage, at once. The coots which were swimming about among the reeds were, so far as we could see, exactly like our American coots.

It took us several minutes to place the bitterns. Of course they are related to the American bittern, but they are much more strikingly colored. Their contrasting greenish black and buff are decidedly conspicuous in flight. We could hardly believe our eyes, when we saw one climbing the reeds. If American bitterns climb, at least we never saw them do it. But their way of stalking, finally told what they were.

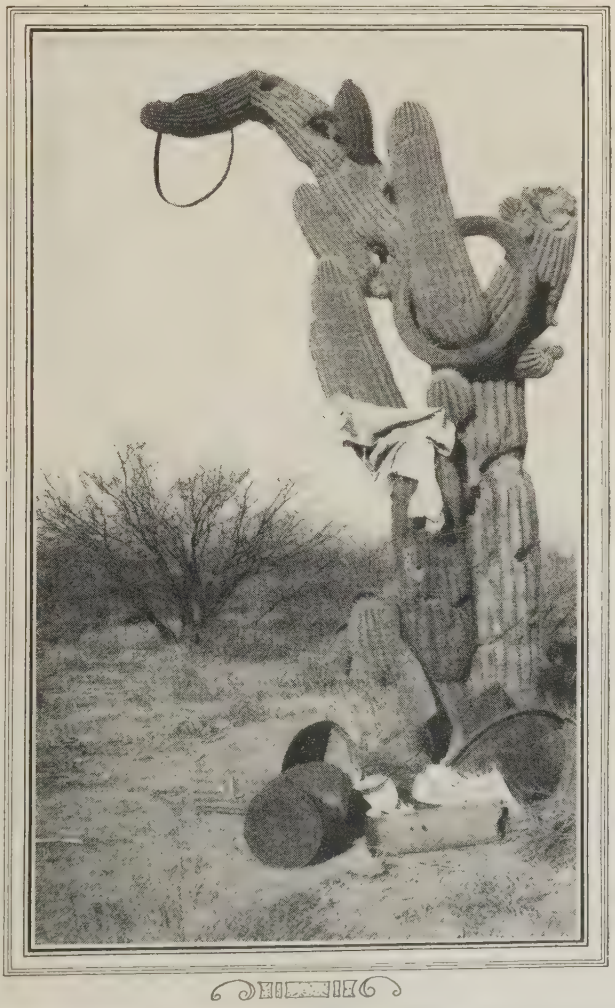
Montreux, Geneva, Interlaken, Lucerne, crystal-clear lakes, each with its own distinct shade of blue or green; Jungfrau, Matterhorn, Mont Blanc, and countless other mighty peaks,—all these were in the composite picture we were forming of the Alps.

But we must not omit another very important feature,—wild, deep gorges, through which rivers rush noisily, beside the footpaths or the highways on which we rode or walked in awed silence. Best of all, was the country of the upper Rhine along the Via Mala.

Two birds we found along those rushing streams. One was the dipper, the European water ouzel. Dippers are nowhere very abundant; it is even said that a pair stake off a claim to a certain section of a stream, and will not allow another to enter their domain. But probably all the rivers and mountain brooks have their quota, and one sees them sooner or later.

The other bird of mountain torrents is the gray wagtail. Called gray, we said jokingly, because he is yellow; for a most brilliant yellow covering the underparts is the color that strikes the eye. Still, he is gray above, so the name is not entirely wrong. The white wagtail also, is usually found near water, but more often in the open meadows, nearer civilization.

So our list kept on growing. Even the skeptic who said when he joined our party, that he could not afford to go to Europe to study birds, admitted that it was not turning out at all as he expected. He was seeing everything that Europe had to offer, including birds. Whether he wished it or not, his interest in bird study was going along with him wherever he went. And especially here in the Alps, where the beauty of the great, wonderful out-of-doors is ever before one, birds were adding much of unforgetable pleasure to his trip.



The Sahuaro's Shame

By O. R. Philip

What shameless hand has wrought this mockery
Of Arizona's emblematic crest?
What wanton mind conceived debauchery
So low, it dares e'en Nature to molest?

Throughout the years, e'er since was first disclosed
This tree, that has to stalwart stature grown,
Time and the elements had not imposed
Such ugly, scarring wounds as now are shown.

Festooned with trash, that bends its weakened limbs;
A mark for lead; with knife and axe defiled!
Crude labels carved to humor foolish whims—
Destruction's devotees have here run wild!

No work of brown-skinned desert dwellers, this,
Nor Conquerors in Coronado's train,
Not Jesuits nor the sons of Saint Francis,
Co-planters of the Cross upon this plain.

None in that long parade of pioneers,
Trappers and traders, rangers of the herds,
But would have scorned such desecration drear—
It stood unmarred by all, save nesting birds.

Twins of our image are the trespassers,
And shall we then some day, too late, lament
Our apathy, which cloaks these ravishers,
And to our duty leaves us recreant!

Solons awake! 'Tis time to raise a ban
Against the mutilating hand of modern man!

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GILBERT WHITE'S VILLAGE

A Peek at old Selborne

by Mary Cranfield

Photographs by Miss K. Becher

PERHAPS HE LOOKED LIKE THIS

No portrait of Gilbert White, the author of "Natural History and Antiquities of Selborne" and one of the characters of the eighteenth century, was handed down, but Edmund J. Sullivan pictured him as a prim and studious gentleman

SIGN-POSTS and maps tell of several routes to Selborne, but they are not all to be undertaken lightly or unadvisedly. Two of the roads at least lead through fords of doubtful depth, and a third way climbs at the last minute up a surprisingly steep and twisting hill to the hop gardens at the end of the village.

In Gilbert White's days Selborne was still more cut off from the world by its roads. "Among the singularities of this place," he writes, "the two rocky hollow lanes, the one towards Alton, and the other to the forest, deserve our attention. These roads . . . . are, by the traffic of ages and the fretting of water, worn down through the first stratum of our freestone, and partly through the second; so that they look more like watercourses than roads; and are bedded with naked rag for furlongs together. In many places they are reduced sixteen or eighteen feet beneath the level of the fields."

The description might well have been written at the present time, after the snow and floods of January! Except for some improvement in its roads and a few new buildings, Selborne seems little changed since its Natural History was written. The village, with its beautiful thatched and timbered cottages, the oldest of which was destroyed by fire this winter, still "consists of one single straggling street, three quarters of a mile in length, in a sheltered vale, running parallel with the Hanger."

WHERE GILBERT WHITE LIVED

The second-story window in this wing of The Wakes lighted the sage's room

At the far end is The Wakes—White's own house—and it must be owned that from the street one's first impression is one of disappointment. It is only from the garden at the back that the long low house reveals both its age and its charm. Here little is changed since the days when Gilbert White watched the antics of his favorite owls round the old oak tree, or made his observations on the sundial he himself put up. It was on these paths that a pair of hoopoes were wont "to march about in a stately manner," till they

THE SELBORNE YEW

More than a thousand years old. It rivals the Darley Dale tree in antiquity, and is twenty-seven feet in girth

were "frighted and persecuted by idle boys who never let them rest."

On this side of the house his own room still looks across the lawn and park to his beloved Hanger—the wood which crowns the steep hillside beyond, so familiar to all his readers. Over the fire-place, in this room where he wrote his last journal, is a small panelled cupboard in the wall which held his wine.

It was to The Wakes that Gilbert White came home when, at the age of thirty-five, he left Oxford for good. He was then a Fellow of Oriel College, but no offers of preferment could tempt him to remain, nor would he accept any of the College livings which were offered to him from time to time. Though he was in Holy Orders, he never became vicar of Selborne, but for many years he held the neighboring curacy of Farringdon.

In these days of books it is difficult to realize his position as a naturalist. A man must go far afield indeed nowadays if he would be an explorer of unknown Nature; but Gilbert White entered at once on an untrodden path. He himself gives a hint of this when he writes to his friend of "many common birds that have as yet no English names;" and in another letter he owns that at present he knows of only two species of bats.

The whole field of English natural history lay before him, and most of it was still undiscovered country. What books there were were crammed with absurd and monstrous fiction, such as that of the swallows' hibernation under water. "A Scottish naturalist," he writes, "is so much persuaded of that fact, that he talks as familiarly of the swallows going under water in the beginning of September as he would of his poultry going to roost a little before sunset!"

The student and lover of Nature, living his quiet life in this remote village which he hardly ever left, watching his birds, or feeding his tame bat with flies from his hand, was in truth a pioneer and explorer in unknown territory. He writes to tell his friends of the adventures great and small that befall him in this life of discovery; but sometimes the little affairs of the village draw him aside from the more important world of birds and beasts. The making of rush lights fills one whole letter—the difficulty of peeling the rushes so that one single rib is left to support the pith, the action of sun and dew, and the relative advantages of bacon or other fat for the dipping of them, together with comments on the wicked extravagance of some of the younger housewives who indulge in the luxury of halfpenny candles.

Later, when Daines Barrington, one of his two principal correspondents, suggested publishing the letters, White added an introduction in the form of nine imaginary ones—less charming than the rest and more studied, but full of delightful descriptions of Selborne and the country round.

The village lies, he tells us, "not far from that vast range of mountains called the Sussex Downs." The soil to the northeast "consists of a warm, forward, crumbling loam," but on the other side it "becomes a hungry, lean sand till it mingles with the forest, and

THE SUNDIAL ERECTED BY THE NATURALIST

Gilbert White's garden is a thronging place for visitors

ENGLAND OF THE PAST
Here is a corner in Selborne, and its ivy-covered, thatched house with mouldy stone walls

will produce little without the assistance of lime and turnips." Lower down the slope, towards Wolner Forest, we have "a wet and sandy loam, remarkable for timber, and infamous for roads." Those roads are evidently a sore subject! At each end of the village rises a little stream; that on the northwest becomes a branch of the Arun, while the stronger spring on the southeast joins the Wey, flowing as a considerable river through Godalming and Guildford.

Just beyond The Wakes, before the road turns down-hill to the Grange Farm and takes the name of Gracious Street, is the Plestor, a wide grassy space with a tree of quite respectable age in the middle, and paths leading across the grass to the Vicarage and churchyard. The glory of the Plestor has departed, however, since 1703 when "an amazing tempest" overthrew the vast oak whose branches spread almost to the houses on the far side, to the "infinite regret" of the whole village. So concerned was the Vicar at the loss that he bestowed several pounds to have the tree set up again in its former position. It seems scarcely a matter of surprise that this care was wasted, for we are told that in spite of all that was done the oak withered and died.

Selborne was famous for its trees. A beech in the court of Norton farmhouse lost in that same tempest a bough equal in size to a moderate tree, and when later the tree itself was cut down for timber, it measured at seven feet from the ground "near eight feet in diameter."

One at least of the giants of old survives and flourishes to-day. Just inside the churchyard stands a gigantic yew, said to have a circumference of twenty-seven and a half feet. Looking at the immense trunk and the splendid spread of its feathery branches which sweep the ground in places, it is not hard to credit the local tradition which makes the Selborne yew the largest in the world. Its principal English rivals are the famous yews of Crowhurst and Darley Dale.

Gilbert White writes of the tree among the Antiquities of Selborne, and he discusses at length the reasons which may have caused these churchyard yews to be planted so frequently in the south of England—whether for the supply of bows for archers (for which purpose a single tree of such slow growth as the yew must have been hopelessly insufficient), or for green branches with which to deck the church at festivals; as symbols of immortality, or simply as shelter for the church from the prevailing southwest gales. It is curious that their position is nearly always the same, near the southwest corner of the church. Whatever the reason, the history of Selborne yew can be traced back with certainty for a thousand years, and, more doubtfully, for two hundred more. It is believed to have been planted when the first Saxon church, of which all traces are now lost, was built.

Under its branches is a single grave—none have been allowed to be dug there for many years for fear of injury to the tree. The distinction belongs to a functionary who held the strange office of village trumpeter. His chief duties seem to have been in connection with the organized forays on neighbouring and rival villages which appear to have been fairly frequent. One historic encounter took place at Butts' corner at Alton, and the trumpeter, if old records can be believed, played his part in a glorious victory for Selborne.

Passing the yew tree and the trumpeter's solitary grave, we reach the beautiful twelfth and thirteenth

"OF SMALL INTEREST . . . ABOUT THE TIME OF HENRY VII"
So was this church characterized by the naturalist. He wasn't up on architecture

century church which Gilbert White dismisses with strange contempt as having "no pretensions to antiquity, being, I suppose, of no earlier date than the reign of Henry VII." Even he, however, acknowledges the age of the pillars with their cleanly cut capitals, and he puts forward the strange supposition that the pillars are the remains of an older building, and that the present church was built on the top of them! Architecture does not appear to be the great naturalist's strong point; and in this his editor of 1875 follows his lead, for, in a footnote, he refers his antiquarian readers to neighbouring churches if they would find anything worthy of their attention.

But the visitor's first object will be to discover Gilbert White's grave, and in this search he will find much to confuse him. In the middle of the chancel is a gray stone slab bearing the name Gilbert White; but this is the tomb of the naturalist's grandfather, who for many years held the Vicarage of Selborne. On the south wall of the sanctuary, among numerous epitaphs of departed Whites, is a stone with the (now) wholly false information that in the fifth grave from this wall is buried Gilbert White. Probably the present position of this tablet accounts for the persistence with which most guide books send their readers to hunt vainly among the graves on the *south* side of the chancel for the one they seek. The explanation is that the tablet was originally fixed on the outside of the chancel on the north side, for here is the curiously long, narrow mound with the simple small headstone inscribed only "G. W. 26 June 1793."

There is a fine modern window to his memory in which St. Francis is seen preaching to his little sisters, the birds. All the Selborne birds have come to listen in varieties which would have puzzled the Umbrian Saint if he had noticed his audience in detail. Benjamin White, the bookseller, whose tablet is now also inside the chancel, was one of Gilbert's brothers and publisher of the book the fame of which now draws travellers to Selborne from all parts of the world. The fine Dutch altar-piece representing the Visit of the Magi, and which is attributed to Mabuse, was his gift to the church.

If, before leaving the village, we go to the Queen's Hotel in search of tea or picture post-cards, the first thing that meets our eyes presents a strange contrast to all Selborne's gentle memories. Hanging on the wall just inside the door is a framed copy of the *Times* with Nelson's despatch telling of his victory, at Trafalgar, and how he himself was unfortunately wounded and had to be carried off the deck.

It is almost a shock to be taken so abruptly back to human history and the great world outside after this.

A DOG OF SUPERIOR MENTALITY
This is International Champion Prinsessen Elfrieda von der Konigstad

The DOBERMAN PINSCHER

by Josephine Z. Rine

PINSCHER is the German word for terrier, and Doberman is the name of the man who first started breeding this dog scientifically. In the year 1863, Herr Doberman, bell ringer of Apolda, discovered running about the streets a huge black and tan that seemed to combine the color of the old border terriers with the type of the ancient shepherds. He realized that here was material destined to develop an unusual dog and so by careful selection, he bred him for years in the way he would have him go. Various crosses were tried in the hope of speeding improvement, but none produced as true a type as the pure blood of the original Apolda dogs. And when Herr Doberman died, another, Goeller by name, took up the work where Doberman left off, and between them, they evolved a business-like dog with an amazing brain, for they made of him a police dog.

The term police dog is often misused. It does not designate breed but on the contrary a form of special activity, hence may apply to any breed of dog used in police work. Early in his career, the Doberman showed such an aptitude for training that he was made into one of the most efficient workers of his time. He is friendly with the reserved friendliness of the higher mentality. He neither grovels nor makes advances; he is courteous, faithful and dignified but he rarely forgets an injury. He does not require commendation as the purchase price of loyalty but gives freely of his affection when he finds that conditions warrant.

The Doberman is squarely built, powerful but very agile. His head is long and deep muzzled, and his exceptionally bright eyes carry a light of intelligence and penetration. His ribs are deep without excessive breadth, rendering him swift on his feet and graceful in action. His bone is heavy but not coarse, and his color may be red, or black with tan markings.

Hunting Nature on Wheels

AS EVENING FALLS ALONG THE MOTOR TRAIL

There is the constant lure of the unexpected, the thrill of the open to motor camping

WHERE there are roads automobiles can go, and sometimes where there aren't any roads, automobiles can get there just the same. Automobiles are the delight of hunters, the despair and the death knell of game. But, if the hunter be hunting only to observe or to photograph and not to kill, the automobile is a great boon. It not only supplies transportation, but sometimes even serves as a blind for observing those animals which have not learned to associate a car with death-dealing weapons. Several times the writer has sat comfortably on the cushions and watched deer at close range. Many times, along the California beaches, he has driven close to the waves and photographed curlews or sandpipers, when—at the first sign of his getting out of the car and appearing on his own two legs—the game would take fright and disappear.

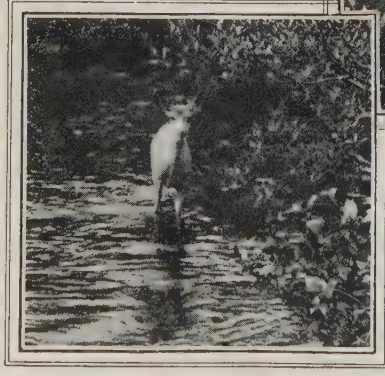
The greatest of all pleasures open to any automobile owner is travel through the wilder sections of our country,—not with the idea of getting to some particular place as soon as possible, not with the idea of beating transcontinental speed records, but solely for the purpose of seeing all that can be seen, with comfort and economy. What sort of equipment does one need for this kind of tour? Some take one thing, and some another; but when motor camping, especially if there are a number of people to go in one car, or a lot of bulky equipment for photographic or scientific work, space and weight must be considered. This is especially true since comfort

(Right) MULEDEER WHO EATS THE TOPS OF SQUAW GRASS IN MOUNTAIN MEADOWS

Curiosity about these humans is the only deterrent to taking full flight

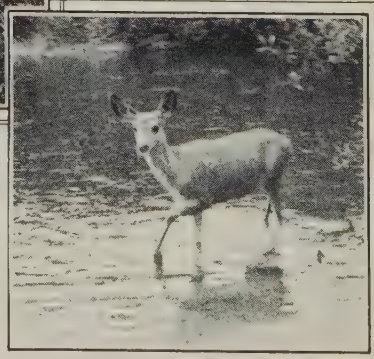
THE LARGE EARS ARE RESPONSIBLE FOR THE COMMON NAME OF MULE DEER

This youngster was filmed during its dainty progress in the stream



(Left) BENEATH THE SHADE BY THE STREAM'S BANK

She regarded the photographing party with a sort of quizzical wonderment as to what went on



Motor Camping a Fine but Not Difficult Art

by

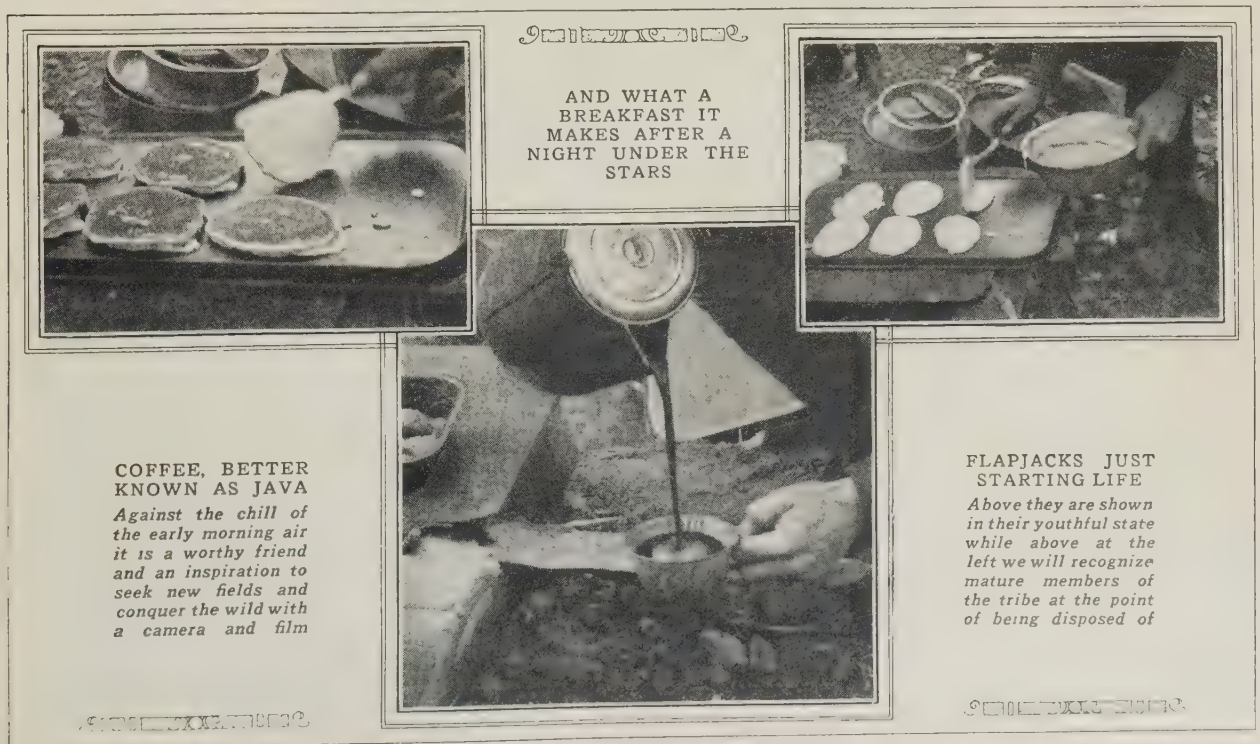
Arthur Newton Pack

SUCH IS THE SCENERY IN OUR NORTHWEST

Snow-capped mountains wreathed in clouds rear in majesty on every side of the highway

need not be sacrificed therefor. In taking wild animal and bird pictures one must be prepared to stop anywhere, to camp at any spot, or to follow the trail of whatever we are trying to photograph on foot. Some motor campers take along such a pile of bulky stuff that one can hardly see over it to the car or its passengers. Some tourists feel that cots of the canvas or even of the spring variety are necessary to real comfort; but with the sleeping equipment which we take into the wilds we have more than once turned down the offer of a spring cot, even with sheets and blankets, in favor of laying our own bed rolls on the floor. This is not due to any hardiness, assumed or real. I like all the comfort that any situation will afford me and have camped out enough to have progressed beyond the phase of getting a thrill out of unnecessary discomfort. If the nights are cool, there is no bed warmer than one made on the ground.

Be the ground wet or dry, sandy or flint-like rock, there is no foundation softer than our handy one-lung-power air mattress. People have said to me, "But isn't it a tremendous task to inflate an air mattress without a pump?" My reply is, "No." In the first place, we do not use full-length air mattresses A mattress that will reach from the shoulders to just below the hips is all that is absolutely necessary; and although I have slept on longer mattresses, I have never felt that there was any greater comfort to be obtained. The next point is that the mattress must not be blown up hard, anyhow.



AND WHAT A BREAKFAST IT MAKES AFTER A NIGHT UNDER THE STARS

COFFEE, BETTER KNOWN AS JAVA

Against the chill of the early morning air it is a worthy friend and an inspiration to seek new fields and conquer the wild with a camera and film

FLAPJACKS JUST STARTING LIFE

Above they are shown in their youthful state while above at the left we will recognize mature members of the tribe at the point of being disposed of

A CAMP VISITOR
Bruin stops in to look over the camp duffle

It should contain just enough air so that when lying on one's side one's hips barely touch the ground through the mattress. The legs below the knees extend beyond the mattress-covered area, but there is practically no feeling of the mattress ending, especially if it is blown up just right; and that space under the lower legs is just the place to put one's boots or other articles to be protected from the night dew.

If much camping is to be done where nights are cool, I believe that there is no more comfortable or practical form of sleeping equipment than a down sleeping robe, such as we have used on many trips. The item of weight is less than any other sleeping equipment, for the down weighs very little. An adult should purchase one of these robes in the 90 by 90 inch size. Unless the camper is abnormally tall, this robe,—when folded and snapped together in the form of a sleeping bag, as it is supposed to be used,—is long enough to leave a few inches extra to tuck under the feet. These robes are lined on the inside with a stout blanket and on the outside with a tightly woven cloth, thus protecting the down portion from ordinary injury. In the morning, when time permits, the snaps may be undone and the whole thing rolled out for an airing without half the trouble it takes to air out an ordinary sleeping bag. These eider-down robes are in two weights, one for ordinary summer camping use or winter camping in the Southwest, and one for very cold weather in northern Canada. In my experience the lighter robe has the warmth of four blankets and one-third the weight. The initial cost is a little larger, especially if one happens to have the blankets, but the additional comfort, convenience, and saving in both weight and bulk more than compensate. With proper care such robes should last a long time. Of course, it is always well to have in one's camping equipment a needle and thread for immediately darning any small tears in the outside or inside covering of the robe, which some accident might cause.

For the camera hunters, sleeping equipment of this kind can be readily carried on foot for some distance from the car, especially if the demands of wild life photography require sleeping out in a blind or other favorable location; and this is frequently the case. We are able to carry four of these robes and mattresses, each done up in a duffle bag, on the running board of our car, covered with a tarpaulin against ordinary bad weather.

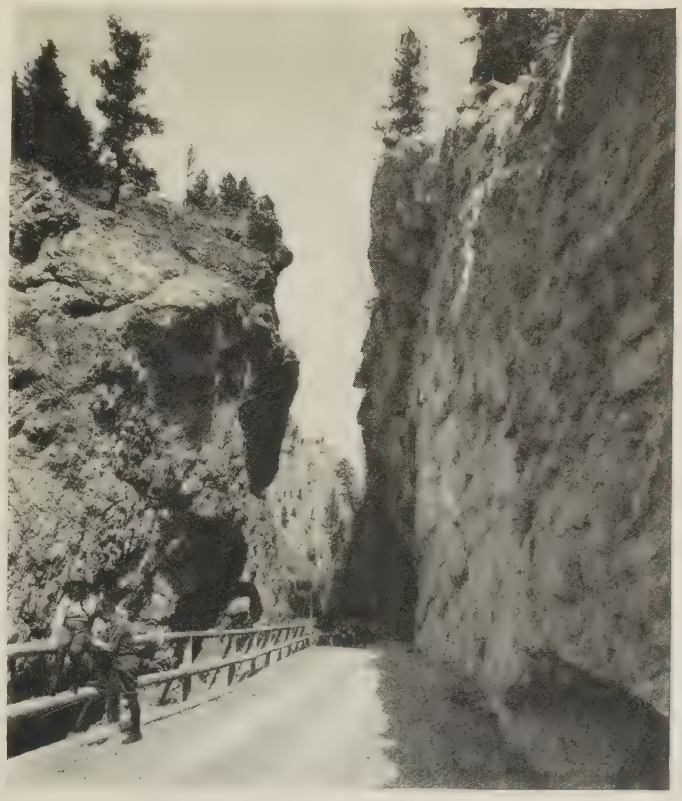
In traveling through country where rains are to be expected, a tent is, of course, necessary; and the umbrella type of a size sufficient to protect the members of the party is, I believe, the most desirable and the easiest to handle. Other tent arrange-

INVESTIGATING THE LOCAL WILD LIFE
(Below) One of the many friends to be made along the motor trail

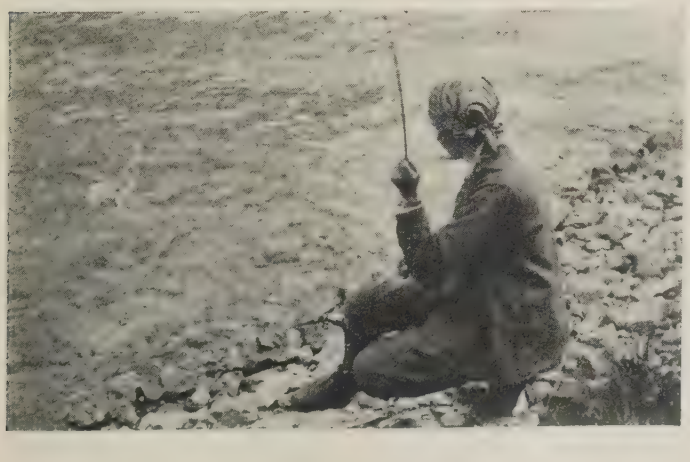
ments such as a large canvas fly which may be attached to the car, thereby avoiding the necessity of poles, are desirable. If the front seat of the car is hinged so as to fold backward when the catches are released, a complete bed sufficiently wide for two people is thus made within the car, provided the baggage can be stored on the floor, beneath the seats, or piled outside under the protection of a large waterproof tarpaulin. Personally, I regard a tent not as a luxury, but as a necessity, to be abandoned in bad weather in favor of some regular bungalow, cabin, camp or hotel. In good weather it is more pleasant and healthful to sleep out on the ground, insulated by air mattress and down coverings, and using the car only as a dressing room.

When camera hunting for birds and larger animals, one must frequently be up early and work late, and for that reason the process of camping must be reduced to the minimum of labor and time consuming activities. Accordingly, except in rainy country, we do not carry a tent at all, but use a large waterproof light canvas, sixteen feet by eighteen feet, which is spread on the ground. On half of this we spread our mattresses and sleeping bags, which are thus protected from dust and dirt of the ground, as well as from dampness, and fold over us the remaining half. The edges fasten halfway up the sides to make a sort of bag, and the remainder, reaching over our heads, may be supported by a rope from the car, from trees, or from poles, to make a sort of fly. This gives full protection from the dew and from light showers and is more easily laid down at night and folded up in the morning than any tent.

THRILLING ROAD
Some curves on the Columbia River Highway



ALONG THE BANFF-WINDEMERE HIGHWAY
(Below) A stop by the side of a stream for a bit of sport



For cooking we carry a two-burner gasoline stove and aluminum utensils, such as may be purchased at any good outfitting store, so arranged as to nest inside each other and take up the minimum of space. The gasoline stove is very easy to operate. No firewood is necessary, except for an evening camp fire, for, of course, no stove takes the place of a camp fire. I am one of those who like my breakfast,—including a cup of hot coffee,—as soon as I get up in the morning; and with this outfit it is possible to satisfy one's desire within ten minutes. When camping for pleasure only, the folding oven attached to this gasoline stove permits all sorts of culinary feats, and the rules for its operation are little different from operating the gas stove at home. Incidentally, the cooking utensils are not smoked up as over an open fire, and are thus easier to keep clean.

When traveling in dry or desert country, a water-bag is, of course, a necessity. The water gradually seeping through the cloth covering of

the bag evaporates even in the hot wind and keeps the water within deliciously cold. Generally this is not necessary in the Northwest, but it's desirable in many places where good sweet water can not be guaranteed. Occasionally, one finds it necessary to camp at a place where the quality of the water supply may be questioned. Most of the organized camps throughout the country have good water supplies which are not contaminated; but where one is up against it, it is always possible to use the old army and Boy Scout formula and add two drops of iodine from the emergency traveling kit to each quart of water. This is not absolutely guaranteed to kill all germs, but it is a useful protection and reasonably safe.

Motor camping is a pleasure in itself, but becomes doubly delightful when combined with camera hunting as is always possible in the Pacific Northwest or Southwest. Last summer we started by automobile from Seattle, visiting the demonstration forest of the University of Washington on the Mount Rainier Highway, Mount Rainier, and then going back over our route to the main highway over Snoqualmie Pass. We camped one night at the top of the pass and breakfasted there. Our road then led over Blewett Pass,—a new and most spectacular gravel highway through the National Forest, all the way through western yellow pine, fir, and larch. We crossed the summit at 4,200 feet. Then down, down again to Wenatchee, where we crossed the Columbia. Following up the river on the east bank for some thirty miles, we turned eastward again, climbing steeply up Pine Canyon to Waterville in the great wheat prairie country, with its endless miles of golden grain. Our road twisted downward after a while into Moses Coulee, up again and then to Grand Coulee. These coulees are dry canyons like ancient river beds, walled with rocky bastions of curious shapes, rising perpendicularly above the talus slope at the base of the cliffs.

During the afternoon we pulled into Spokane to enjoy cold drinks and buy provisions. Then on we went again into the lowering smoke of a forest fire, searching for a camp spot with water. Darkness began to fall as we reached Coeur d'Alene, Idaho, and we began to follow the road as it clung to the mountainsides above beautiful Coeur d'Alene Lake. We chose a blind side road, but found no level ground and had to retrace our bumpy way in the darkness to the main highway. Just as we were getting pretty well discouraged, the road wound steeply down to a grassy meadow where the moon, just peeping above the shadowy Bitterroot summits, was reflected in a still arm of the lake. We drove almost to the water's edge and ate our supper, glad to be no longer on the move. Bed rolls were laid down, air mattresses inflated, and, as I crawled into my bag, laughter drifted up from the lakeside, where two others of the party were swimming.

We cooked and ate breakfast in comfort next morning and then at the summit of the first range of the Bitterroots enjoyed a second installment, either breakfast or lunch. The road continued good to the mountain line at the summit of the main range, but from there on it became a narrow, bumpy dirt affair, showing only occasionally signs of improvement. At the summit of the "Camel's Hump", the eastern foot-hills range where the grade is very heavy, we were flagged by a Forest Service Ranger who gave us the appropriate speech about fire—this being the Lolo National Forest. Again, when we stopped along the Missoula River to cool and refresh ourselves by wading about, a Forest Service patrolman came up and inspected our "camp", repeating the cautions. Thanks to this warning system, there seem to be comparatively few fires, and the national forests we traversed looked much less desolate than they did eight years ago. In places a natural regeneration of larch had greened over the worst bare spots. With occasional stretches of improved road, we now pushed on toward Missoula.

The next day our road was excellent, following the great Flathead Valley northward, with its rampart of snow-splotched peaks hemming in the eastern side. The marshes teemed with bird life—redwing and yellow-head blackbirds in great flocks, killdeer, grebes, and Wilson phalaropes. Here was paradise for the Nature hunter.

This is but a sample of the lure of motor camping in the Northwest. The greatest thrills for the camera hunter lie within the borders of the National parks, where the wild animals are less afraid of man. Glacier National Park is, perhaps even more than the Yellowstone, a paradise for camera hunters, for one may more easily slip away and elude the crowd. However, it is sometimes necessary to leave the car behind, as the only road which will ever be built across Glacier National Park is still under construction. Nevertheless, by going out on horseback with the same outfit we had for the car, one may see and photograph deer and bear, and even beaver in their native haunts, while a trip up into the mountains will bring us mountain sheep and goats.

Returning to our car, we may push northward into Canada and the Canadian Rockies, and perhaps—as happened to us last summer—we may have the opportunity of photographing a giant bull moose, close to the road. Then, when the weeks of vacation draw to a close, we shall indeed make up our minds that Nature hunting on wheels is the way of all ways to enjoy motor camping and spend a happy summer.

NATURE MAGAZINE GLACIER PARK TOURS

At the time of going to press with this issue a few uppers were left for the July 6 tour. Bookings are being made for the parties leaving Chicago on July 20 and August 20. If you haven't made your vacation plans be sure to consider this remarkable opportunity. It has been possible to reduce the originally announced cost. Write to Travel Editor.

INSECT FOES of the GARDEN

Favorite Enemies of Him Who Grows Plants

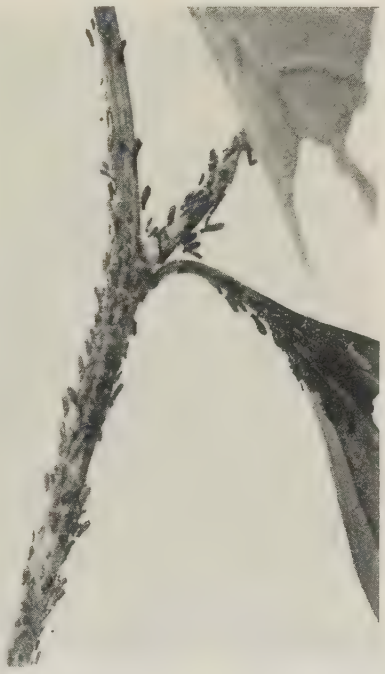
by Alexander Laurie

Photographs by L. W. Brownell

THE delight of making plants grow and bloom in the garden is often clouded by the struggle to eliminate the various pests which prey upon the plants. These plant enemies are of many kinds. Some destroy the foliage, others the flowers, while still others bore into the stems and even into the roots. The methods of control depend upon the feeding habits of the insects as well as the nature of the plant to be treated. Therefore, one of the essentials to success in garden culture is knowledge of insect life, which will prepare the gardener to cope better with any emergencies which may arise.

THE CATERPILLAR OF WHITE-MARKED TUSSOCK MOTH

Below are plant lice destroying a golden glow. Contact poisons kill them



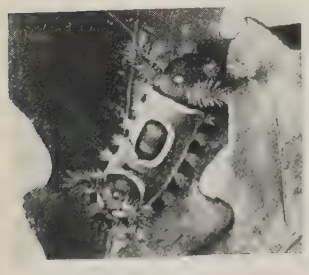
Insects are provided with either chewing or sucking mouth parts. The chewing insects bite off or bite out pieces of plant tissue and swallow these portions. The sucking insects, on the other hand, have specially designed beaks which penetrate the outer covering of the plants and extract the vital juices from the cells underneath. Good examples of chewing insects are cutworms, caterpillars, grasshoppers and various beetles, while to the sucking group belong plant lice, scales and various mites which are not true insects but which may be classified as such when considering control.

Fortunately for the gardener and his plants many of the insects which occur in the garden are not injurious. There are many which are parasitic upon the plant pests and thus prevent their rapid spreading. Foremost among these beneficial insects are the lady beetles and lace wing flies, which feed almost exclusively upon plant lice and scales. The females of many four-winged and bino-winged flies often deposit eggs upon the bodies of caterpillars. These eggs hatch into young larvæ, which feed upon their hosts.

The health and vigor of the plant also help in the checking of depredations by insects, which means that best methods of cultivation, soil preparation and fertilization are essential. Most careful removal of weeds reduces hibernation places and removes hosts which serve for the purpose of egg laying. All refuse from the garden should be removed regularly and either burned or buried. Spading often uncovers many grubs which may be hand picked on a small scale and thus reduces the danger of later infestation.

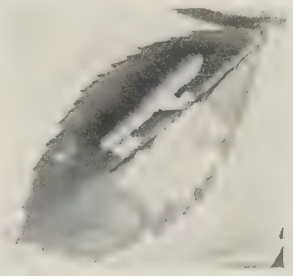
Various chemicals have been tested and found efficacious in the control of pests. For chewing insects a coating of arsenical poisons is placed upon the foliage in the form of either spray or dust. The majority of the pests in this class may be controlled readily, provided that they absorb these poisons in their systems. On the other hand the control of sucking insects depends upon contact insecticides—materials which kill by closing the breathing pores of the pests or by their caustic properties which destroy the tissues of the insect with which they come in contact. As a consequence the first measure of control of this second group depends upon coating the insects' bodies with these toxic materials.

The most effective of the arsenical poisons for chewing insects is arsenate of lead, used in either dry or



THE SADDLEBACK CATERPILLAR IS ONE OF THOSE FELLOWS THAT MAKE A GARDENER'S LIFE UNHAPPY

THE ROSE SLUG HAS SKELETONIZED THE LEAF—IT IS ONE OF THE CHEWING INSECTS OF ILL-FAME



THE STINGING CATERPILLAR
Arsenical sprays do the trick for him. Below is pictured curling snowball aphis injury

age. The same material may also be used in dust form when combined in the ratio of one ounce of powdered arsenate of lead to four and one half ounces of hydrated or air-slaked lime and four ounces of superfine sulphur. Thorough coating of the foliage is essential to secure satisfactory results.

Paris green at the rate of one teaspoonful to three gallons of water may also be used providing that two or three ounces of lime are added to prevent burning. Hellebore is also desirable, used at the rate of one ounce to one gallon of water. Various pyrethrum preparations are now on the market for the same purpose. Some of them are more efficacious than the arsenical poisons and cover a wider range of insects. In fact one preparation is equally effective for both chewing and sucking pests. There are many ingredients used in contact insecticides but nothing better than a combination of nicotine sulphate and soap has been devised. Nicotine sulphate may be purchased from florists and seed houses and is used at the rate of one teaspoonful to a gallon of water together with one ounce of laundry soap or fish oil soap. Various nicotine dusts are also available, and

FALL WEBWORMS, TUCKED IN THEIR NEST, READY FOR HARM
These are among the most harmful groups of insects

liquid form. Three teaspoons of the powder dissolved in one gallon of water gives a spray of sufficient strength. Plants that possess a glossy or waxy foliage are benefited by the addition of one ounce of soap to every gallon of spray. This addition aids in causing the liquid to adhere closely to the foliage. The same material may also be used in dust form when combined in the ratio of one ounce of powdered arsenate of lead to four and one half ounces of hydrated or air-slaked lime and four ounces of superfine sulphur. Thorough coating of the foliage is essential to secure satisfactory results.

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Poisoned bran mixtures are often employed for the destruction of cutworms and grasshoppers. The usual combination consists of one quart of bran, one teaspoonful of paris green, one tablespoonful of cheap molasses and a few drops of banana oil. All these are mixed and enough water is added to moisten the bran. Placed in the rows about the plants these baits are very satisfactory. In general the materials mentioned cover most of the contingencies which may arise but in special cases recommendations shall be more explicit.

The chewing insects may be divided into three groups—those that feed upon the foliage in the open, those that surround themselves with a web, or roll the foliage, and those which feed on the inside of the stems. The first group is readily controlled and comprises the cabbage worm, the hornworm, the corn ear worm, the white tussock moth,—which is a serious pest on shade trees as well as on many herbaceous plants,—the stinging rose caterpillar, the saddleback caterpillar and a number of others. Arsenical sprays or dusts are efficient materials in the control schedule. Among those which spin a web while feeding may be mentioned the webworm, which attacks trees as well as shrubs and many herbaceous plants, the red banded leaf roller which has

caused much damage to chrysanthemums, violets, roses, and honeysuckles, the rose leaf tyer, the corra leaf roller and the bagworm. Due to the web or the rolling of the foliage, control methods are difficult. Penetration of the obstructive surfaces is necessary, but if stomach poisons are applied in the early stages much damage may be avoided. In addition the fall webworms and the bagworms should have their egg masses removed during fall, winter or early spring.

The stem, stalk and root borers present the greatest difficulty of all. Corn, dahlia, cosmos, iris, clematis, rose, lilac, rhododendron and a host of other plants are picked as easy prey by a number of borers. There is no effective way of poisoning these caterpillars. Clean culture, burning of all stems, roots and other dead plants will serve as a preventative. The elimination of weeds as harborers of overwintering eggs is helpful. In some cases, splitting of stems and insertion of nicotine solutions has been attempted but the method is laborious and not always timed right to be successful. Cutting and crushing of wilting tips known to be affected by the borers is often effective.

The various beetles large and small may be checked in their ravages by the use of arsenical preparations.

Snails and slugs are often very destructive in the garden, attacking many different kinds of plants. Most of them are nocturnal in habit, hiding during the day under sticks of wood, stones and other solid materials. Freshly-slaked lime scattered lightly over the soil is the simplest remedy. The lime adheres to the bodies of these mollusks and soon kills them. Three applications on consecutive evenings are advisable. Pieces of wood scattered about the garden will collect many slugs underneath and may be picked up mornings and the animals destroyed.

The sucking insects as a rule are less conspicuous than their larger chewing brothers, and because of this fact and their tremendous breeding propensities, the damage done is of considerable importance. Many are very minute and can only be detected by means of magnifying lenses and frequently through the use of high-powered microscopes. The mites and nematodes or eel worms belong to this last group. The chief offender among mites is commonly known as the red spider. The damage apparent is characteristic. The foliage becomes yellowish-specked along the veins and the leaves assume a stunted appearance. They work on the under surface and prefer hot, dry conditions. Advantage is taken of this preference as a means of partial control. Strong syringing with water will dislodge and drown many. The use of lime sulphur dust, oil emulsion spray and one or two protective pyrethrum insecticides often proves effective in control.

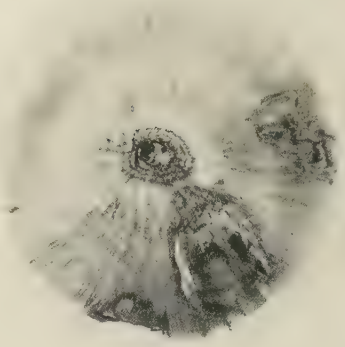
THE BAGWORM MOTH'S HOME
He spends his entire life in this bag. Below is the tree hopper, which everyone can do without

The nematodes are microscopic worms working inside of the root tissues and consequently their control is almost impossible. Sterilization of the soil is the only remedy known. They attack many vegetables and flowering plants producing nodules and protuberances upon the roots. Outwardly the plants lack vigor and eventually die.

Plant lice (aphids) are soft-bodied sucking insects occurring

THE WHITE SCALE ATTACKS A CALIFORNIA ORANGE TREE
All the stages of destruction are shown here

upon many plants in the garden. They are rather simply controlled with contact poisons. Eternal vigilance is necessary, however, since their multiplication is inconceivably rapid, one brood following another. Root lice are more difficult to eradicate. Fresh tobacco dust mixed with equal parts of air-slaked lime and worked into the soil will keep down any ordinary infestation. Rotation of crops will also be found advantageous.



Browning of the petals of flowers, their failure to open, and the appearance of minute black specks on the underside of the foliage may usually be attributed to another set of minute sucking insects—thrips. Nicotine sprays are efficient in their control providing that direct contact is established. Excellent preparations are on the market.

products are useful in this case.

Stinging of emerging buds and the subsequent malformation and "blindness," or failure to flower, are caused by such plant bugs as tarnished plant bug and various leafhoppers. They attack a great variety of plants and due to their great activity are difficult to combat. Deterrents like lime and sulphur reduce infestation. Collection of adults on early mornings and emersion in kerosene is helpful. Nicotine sprays may be applied to the young, before they become active. Clean culture is suggested.

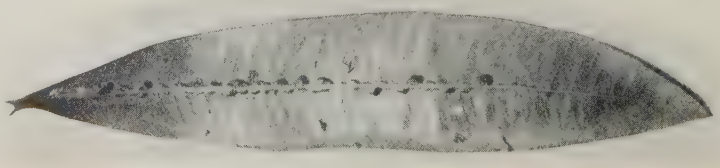
Among the miscellaneous pests of the garden may be listed ants, white grubs, wireworms, sow bugs, termites and earthworms. Each has his particular brand of harm.

Ants are rarely troublesome to plants but are objectionable because of the hills which they construct. Carbon bisulphide poured into several openings about the nest will destroy the whole colony. Calcium cyanide may be used in the same manner. Both of these chemicals are extremely dangerous to human beings and care must be exercised in their use. Sugar and tartar emetic boil is useful. This is made by boiling two ounces of sugar in one pint of water to which one quarter ounce tartar emetic is added. White grubs are immature forms of June beetles and harm many plants by feeding upon the live roots. Carbon bisulphide may also be used in control measures.

THE ATTACK OF THE WHITE GRUB ON THE GLADIOLI *is pictured at the top of the page. At the right is the nest of the webworm*

SOFT SCALE INVADES THE OLEANDER LEAF BELOW *Nicotine and oil emulsions help rid the garden of this damaging pest*

Another group of sucking insects has a wide diversity of forms as well as multiplicity of its plant victims. This is the group of scale insects. As a rule they are clustered and stationary except when just hatched from the egg or escaping from the female parent. The protective covering which is developed is difficult to penetrate and thus the pests are troublesome to combat. The San José scale, oyster scale, the rose scale and the scurvy scale are among the most common of these pests. Spraying is efficacious when done in the spring as the young scales emerge. Nicotine sulphate with soap as well as oil emulsions is used for this purpose. Destruction of infested twigs in the winter is advisable. Closely related to the scales are the mealy bugs, which get their name from the downy covering over their soft bodies. Forcible sprays which penetrate this coating are efficient in combating this pest. Oil emulsions, nicotine sulphate and pyrethrum



Wireworms feed on roots of many plants, but eradication is impossible except by thoroughly working the ground and removing the worms turned up. Sow bugs are controlled by baits similar to those used for cutworms. White ants may be eradicated by pouring carbon bisulphide into their underground galleries.

Heigh-Ho—The Hummers

Brilliant Bits of Summer Bird Life

by Claire and Ralph Prather

Illustrations by Ralph Prather

Who, at one time or another, has not stopped to admire that resplendent bit of life known as the hummingbird—truly it is a fairy to most of us! Burroughs has written about it as "vanishing like a thought" and has said: "The woods hold not another gem as the nest of the hummingbird. The finding of one is an event to date from. I have met with but two, both by chance."

We are dating from a certain spring, that enchanting season which transforms the hill country of southern California into a bird paradise and in which avian architecture goes forward with leaps and bounds.

A silver half dollar would have fitted snugly into the top of the dainty, cup-shaped, mouse gray nest of the black-chinned hummingbird which we finally found, after a week of hunting, on the pendant stem of an olive branch not ten feet from one of our side windows. The sturdy compact walls were less than a quarter of an inch in thickness. Vegetable down and small feathers served as a lining; tiny leaves, dried flowers, insect legs, these latter no doubt gathered in the quantity of spider web with which the whole structure was woven and felted together, constituted the balance of materials used in construction

One would naturally suppose that, located almost on the tip of a more or less unleafed branch, the nest would be very noticeable—but it was not. Color combinations had been taken into consideration when it was built; three radiating leaves flared in front of it and although they did not in any manner hide it, yet they broke up the mass of it into grayish shadows. A casual glance revealed to the untrained eye nothing but a leaf or two and flat shadows—certainly not a nest with depth, form and contour. We saw a keen observer of outdoor life several times pass by the branch on which the nest was saddled, his eyes on a level with it at every passing, his head, in fact, only a few inches from the nest, yet, to our surprise, he missed seeing it entirely.

We are giving the female full credit for having constructed the entire nest home, for at no time did we see the male with building material. When not dancing before the flowers he seemed perfectly content to be an interested observer. But although the nest, when discovered, was built to its proper level it was by no means looked on by the female as a finished example of her craft. A very strenuous task,—that of modeling it to its proper size and shape,—was yet before her, and she spent most of her time during the next few days ramming the walls with her breast and tail until the whole branch, to which the nest was attached, quivered and shook.

Close observation would also lead us to believe hummingbirds live, during the breeding season, by the law of "claim staking". Birds of other species may be allowed within their "claim" but no other hummingbirds. A suitable location is found which must contain or have near it flowers or bloom which can absolutely be depended upon to provide all needs of a growing family for two months. When such a location is found it is "staked" in the name of the female, but in establishing "title" to the claim the male is very active, proving himself of some use after all. Our hummingbird family controlled about three acres and in the beginning had several disputes with claim jumpers in which they were victorious. But during the whole of the breeding season the mother hummingbird held undisputed possession of her domain.

Two spotless white eggs, about the size of small peas, were laid, one the last day of May, the other June first,

VIGNETTES OF HUMMINGBIRD YOUTH

Above we are very young, feeding every ten minutes, but in the right center we have left the nest and taken to the trees, though our flight is wabbly. Now at the lower left we are eight weeks old, quite grownup, if you please, wise in the ways of imitating a leaf on our branch at night

and now the male deserts. Perhaps his disappearance is a bit of bird precaution, as the nest could hardly be kept secret with the gay and conspicuously colored male dancing about the sun-drenched patio of his home.

Nevertheless 'tis true from now on the female takes over all labor and the burden has cost her the easy, carefree life her mate enjoys; she has put aside forever the gorgeous dress on which, at times, she must look with desire; she has even lost some portion of wing-grace which her mate so proudly flaunts. But withal her reward is ample; the rearing of two lusty youngsters is indeed something to be proud of, far more interesting to our way of thinking than idling at the "club" as does the male during these wonderful weeks.

The "club", as we term it, is a male feeding ground. We have found many of them during the brooding season but in no instance have we ever seen a female present. One of these yards, not a quarter of a mile from our black-chin's nest, contained usually an average of twenty-five or thirty males of three species, black-chinned, rufous and Costa. Here, from sun-up to sundown, their shimmering, iridescent bodies bewildered and dazzled the eye as they fed and played and quarreled mid a profusion of bright colored wild flowers, sage and thick growing greasewood.

Much to our surprise the mother throughout incubation left the eggs exposed during daylight hours fully as much as she brooded. She also continued her strenuous ramming of the nest. This, however, seemed exactly what was needed for both eggs hatched, the first one June tenth, the other the following day.

THE MALE IS AN INTERESTED SPECTATOR
While the female does the work of making the nest and caring for the children

We have seen ants almost as large! With head and body of nearly equal size held together by a thread of a neck, they presented a very bug-like appearance. Naked except for a fine brown down upon the center of the back and top of head they were otherwise bluish brown in color while the sides of the head were occupied by knob-like, black, skin-covered eyes which were not opened until the seventeenth day. At that time the young birds had the appearance of being well feathered. Also, contrary to what might be supposed, the bill of the hummingbird when hatched is less than a sixteenth of an inch in length and broad and blunt. The bill grows very slowly, the bird being many weeks old before it takes on adult proportions.

Food was given every ten minutes the first day, the young being fed entirely by regurgitation. This feeding is a strenuous tug-of-war; one unconsciously holds his breath; how is it possible for such a bill as the mother possesses to disappear entirely in a tiny nestling, seemingly not half so long?

Birds hatched naked are very much like the human baby in that they must be cuddled, cradled, fed and cared for—between times they sleep. Singularly enough the mother brooded little if any either day or night after the first ten days. Growth was a slow steady process; down covered them in five days, pin feathers showed in eight while it was not until the twenty-fourth day,—the fourth of July,—that a little dull green showed on the twins' well feathered backs and on this day as well their first faint "tweet" was heard —some celebrating!

The first real flutter of growing wings was achieved on the twenty-fifth day and now meals were served twice an hour instead of every ten minutes as during the first days. Having no control of their feathers the youngsters seemed far too large for the nest; they even appeared larger than the mother, and not until they were eight weeks old did they gain the power of drawing all their feathers close and sleek as does the adult bird.

The wings of a hummingbird are large for the size of the bird at all stages of development—and such wings! It has been estimated, in the adult, they have a stroke of six hundred to one thousand a minute! And with such a high powered dynamo at its command it is no wonder the hummingbird is master of the air. However, we have studied their longer flights countless times and never could such flights be termed swift. What gives the impression of swiftness is not the ability to fly fast so much as the ability to stop quickly! In this they are supreme; here it is they confuse and trick an observer; before the human eye can register one stop the bird has

darted in another direction, making perhaps two or three turns or spirals before he can be focused again. Add to this the fact that in flight the wings, almost the largest part of the bird, become practically invisible, that the long, slim bill is not seen, that all the feathers become absolutely glove-fitting and what is left of the tiny body is blurred and hid by the wing movement—certainly there is little for the human eye to follow!

During the next few days while their tails were lengthening the young often raised themselves to the full extent of their legs, humming their wings and clinging for dear life to the bottom of the nest. At any time we expected them to leave, yet at ten o'clock on the night of the twenty-ninth day we found them sleeping peacefully.

At 4:45 a. m. the following morning the nest was empty!

Our little family had not left us without a last farewell, however. Standing there mid the olive and orange trees, in the cold gray mist of dawn, with a queer lonesomeness tugging at our hearts, we were overjoyed to hear a faint but familiar "tweet-tweet" coming from an olive tree some forty feet from the nest. One of our baby hummingbirds was discovered in the branches of the tree, the other on a shoot but a few inches from the ground. Both were shaking from exhaustion, nervousness and cold. Carefully we lifted the weaker one up to a place beside the other and the next instant the mother arrived with breakfast.

Thirty minutes later the father bird appeared over this olive tree and was allowed to alight and remain a short while. Then he and the mother flew away together. This was the first time we had seen the male for exactly a month yet how did he know the exact hour of his babies' flight unless he was at all times in close communication with the mother?

For the next two days the serving of meals was put back on the ten minute schedule and the favorite position of the young was perched on a twig close together with heads reversed as had been their habit in the nest.

Flight the first and second day was a poor exhibition; weakness, poor distance judgment and lack of confidence were very evident but withal they were never forced to the ground. We had the young in hand on the evening of their third day in the trees and found tails and wings showing marked growth.

Adult birds as well as young, even the first day out of the nest, prefer an unobstructed perch. Certain perches are selected and always used; they do not vary a quarter of an inch the spot where they rest and in the case of twigs the bark at this spot is often worn perfectly smooth.

As in the matter of placing its nest, so in the matter of placing itself when at rest and repose in the trees, the hummingbird is unexcelled in camouflage. Its natural position when perching is with head and bill slanting decidedly upward; even the young assume this position as soon as the neck is strong enough to hold up the head. But at night the bill, head, body, tail and wings assume fully a forty-five degree angle to the perch, the bird appearing pointed at both ends, and its silhouette is practically impossible to distinguish from that of a leaf.

The fourth day out of the nest the young perched in the same tree for the last time, and on the seventh day they were both flying over practically the entire feeding ground of three acres, chasing one another in play.

Not until they were seven weeks old were they weaned, amid loud protests that had no effect on the mother. A few days later, when fifty-eight days old, they disappeared from the feeding ground during the day, returning each evening just before dusk, however, to perch in their accustomed places. At this time their bills were not quite seven tenths of an inch long.

When sixty-three days old they finally left us to follow the flowers up the slopes of the mountains. To us this suggested cool, deep woods . . . perhaps another spring in the altitudes . . . mellow days . . . camp fires . . . sleeping bags . . . wonder nights . . . the grandeur of the Sequoias . . . the picturesque Yosemite. Perhaps we were lonesome; in any event we followed the twins.

The National Flower Vote

With 262,542 votes cast to date in the National Flower poll, with the radio now an additional factor in the appeal to the voters, the nation is showing the enthusiasm and activity of a political campaign in its election of a floral symbol. Ballots pour in at the rate of 4,000 a day. Active drives for votes are covering 30 states.

The first tabulation by states reveals that Iowa, Missouri, New York, Pennsylvania, Texas and Wisconsin have taken the lion's share in the referendum. Montana, Nebraska, Nevada, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont and Wyoming may not have their proper influence if their citizenry does not respond in greater numbers.

Much criticism is being levelled at the leader, the wild rose, because the rose happens to be the national flower of England. The final returns will prove whether or not it is justified. The demure violet has made the greatest gains during the month.

The Leaders

Rose	120,219
Columbine	40,796
Violet	31,950
Goldenrod	27,270
Phlox	12,430
Daisy	6,127
Dogwood	4,878
Am. Beauty Rose	3,915
Mountain Laurel	3,644

THE BOGUS GOAT SURVEYS CHANCES OF FILMING THE LOCAL VARIETY

BILL and the BILLY

A Disguise that "Got the Goat" of the Rocky Mountain Goat

LONG ago, when great bands of American antelope roamed our western plains, it was the practice of the Indians to attract the attention of these animals by the simple expedient of waving a red flag above a blind. Curiosity, which is such a strong trait of all the antelope family, lured the quarry to within reach of the deadly arrows, and Indians banqueted. Now, the Rocky Mountain goat is a relative of the antelope family, shy and elusive and most difficult to approach for the purposes of photography or anything else. Would a similar plan work?

When Bill Finley deposited his pack on the narrow ledge and produced a roll of white flannel that looked like a cross between a child's sleeping suit and a circus clown's costume, three other members of the party gasped. When Bill donned the thing and pulled over his head a hood with two waggling ears and a pair of curved black horns attached, we could hardly keep from rolling off the cliff with laughter, the more painful because it had to be smothered. Away on the opposite ledge stood a Rocky Mountain billy. He was too far off to register on the film and we did not believe he had seen us, but we knew that at our first attempt to approach more closely the game would be up—at least, the goat would be up the mountain and out of sight.

Bill Finley finished buttoning the grotesque affair, concealed a camera in his bosom, and dropped down on his hands and knees. "Whatever that goat does I'm going to do," he announced, "but I'm going to get nearer all the time." He moved off slowly in the direction of the real billy, stopping now and then as the goat did, "to graze". A good imitation it was, also.

ROCKY MOUNTAIN GOAT ABOUT TO BE MYSTIFIED

Shortly it will encounter a goat the like of which it never before has seen

WHISKERS WAVING IN THE BREEZES
Bill, camera safe in the stomach of his disguise, looks down and spots his prey

other on his ear, he opened a wide gap in his face and proceeded to stuff in a bacon sandwich.

Such was taking place when Nanny materialized from nowhere, as mountain goats do, and ambled past directly beneath us. Somehow or other Bill thought it would be better to try her with one of her own sex, so he stepped out of his skin and Gipsy stepped into it. She and Bill set out in pursuit, the idea being to get both nannies into the same picture. Although Gipsy said that she didn't feel much like a nanny goat, we all agreed that she looked like a ninny.

The stalking of goat by goat was now repeated. In her nanny costume Gipsy caught the spirit of the occasion and descended ledge by ledge in a manner which none of us would have believed possible. Once or twice we held our breath, but those horns and ears seemed to give her a steady head, despite the whiskers, which blew out in the wind. Bill stayed a little above with his camera; the real nanny lay peacefully watching the false goat. Suddenly the false white goat appeared

Billy stood poised and sniffed the air. Bill stopped and tried to give an unconcerned appearance to his white flannel exterior. Billy evidently concluded that it wasn't his fault if the creator of goats had slipped up a bit and turned out a mistake. He kicked out a place with his feet, and lay down. Bill tried to imitate him, but somehow or other that strange fore-leg which was stuck into Bill's stomach and there lovingly fondled, the camera, got Billy's goat. Billy got up, waggled his ears, and looked worried. Bill tried some more grass and then crawled nearer. Minutes passed. Nearer, nearer. Only a hundred feet now. Billy was still lying down. Nearer! Suddenly, to Billy's horror, that strange misfit goat removed his fore-leg from his stomach, raised a black tube, and emitted a fearful buzz. Now, goats may have a language of their own, but it certainly does not include a noise like a motion-picture camera. Up to this time Billy had perhaps concluded that he had partaken too freely of glacier flowers last evening, but this nightmare was too realistic. He sprang to his feet and plunged down the mountain. He ran not as a goat does from a human being, but frantically, bending every effort to get away. Perhaps he thought that the horned goat devil was after him. Billy stopped, presumably, somewhere this side of the Arctic Circle. The false goat now rose up on its hind legs and came back to join the three ordinary human beings on the ledge. With a firm front hoof on his whiskers and an-

A GOAT IS REALLY GOOD AT THIS
And several in Glacier Park to this day wonder why this "goat" used his hind knees

THERE IS NO DISGUISE ABOUT THESE TWO
But it was Bill's makeup that let him make such fine shots of the real thing

around the corner of the rock and advanced toward her. The nanny rose, stood and stared, not noticing the man with the camera above. She grew nervous, decided on a higher altitude, and started for it, only to trot full speed ahead towards the barrel of a buzzing tube. Behind it stood a man. Nanny whirled like a flash, took a cliff in a couple of bounds, and was off in the direction of northern Canada.

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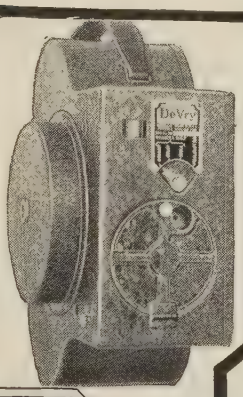

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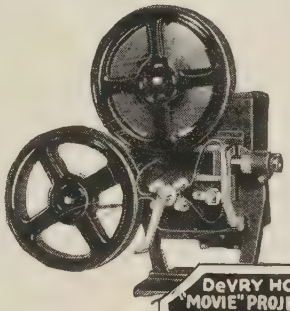
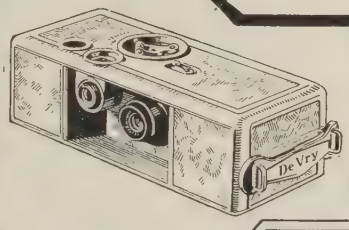


DeVRY HOME "MOVIE" PROJECTOR $37.50



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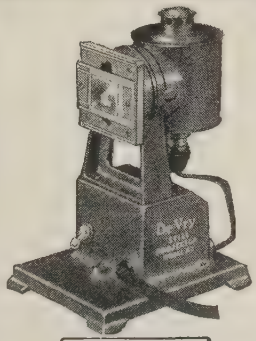

De VRY "STILL" PROJECTOR $15.00

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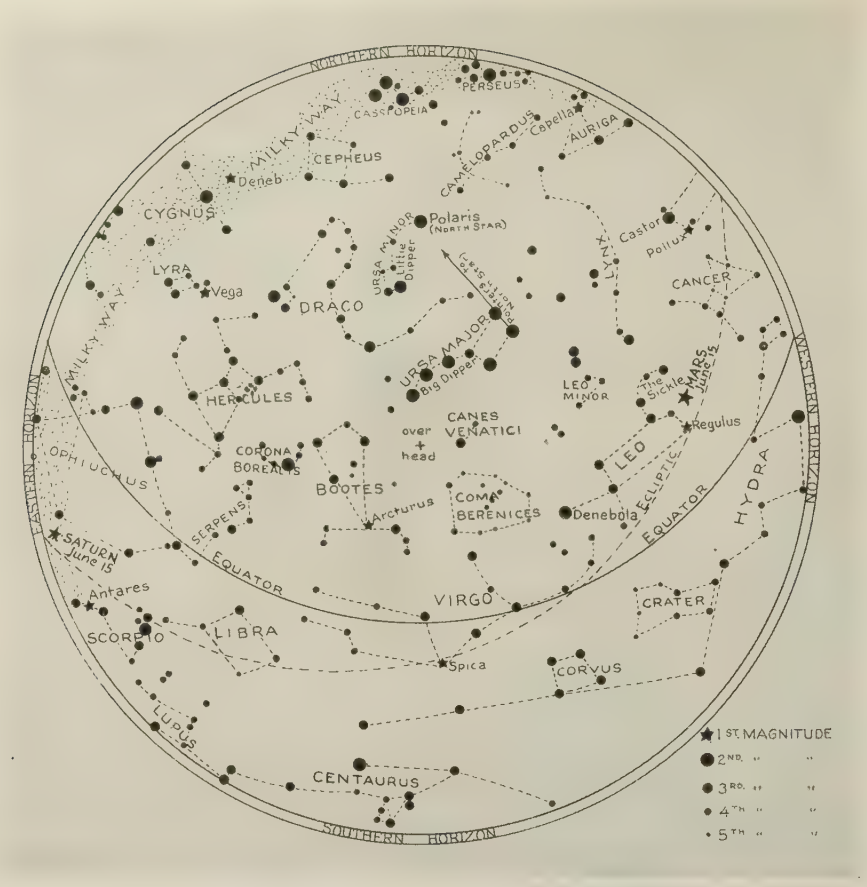

TO USE, HOLD OVER HEAD WITH TOP TOWARD THE NORTH

This map is designed for use on June 1, 9 p.m.; June 15, 8 p.m.; June 30, 7 p.m.

THE NEBULAR HYPOTHESIS

How La Place Explained the Origin of the World

by Isabel M. Lewis

When LaPlace, the French Newton, as he has often been called, advanced his celebrated Nebular Hypothesis to explain the origin of the solar system it was in the form of a note in a remarkable popular treatise on astronomy entitled "Exposition du Système du Monde", published in the year 1796. He warned his readers that it was propounded "with that doubt which everything should arouse which is not a result of observation or calculation". Time has proved the wisdom of this statement, for fundamental weaknesses in the theory have been gradually exposed, partly as a result of the discovery of members of the solar system unknown in the day of LaPlace, and these defects have led to its gradual abandonment by the leading mathematicians and astronomers of modern times. Yet so clear, plausible and easily understood was this famous hypothesis that it met with unusual favor even from the beginning and was widely accepted and taught during the nineteenth century and almost up to the present time. Many astronomers of today first became acquainted with the nebular hypothesis in textbooks of physical geography in their high school days, and some are even now reluctant to part with it.

Briefly stated in its most essential form, the nebular hypothesis assumes that the solar system originally consisted of a nebulous mass of highly heated gases extending beyond the orbit of the outermost planet, Neptune, and rotating like a rigid body, in the direction in which the planets now revolve around the sun and in which the sun turns on its axis. In the process of condensation the mass contracted and its angular veloc-

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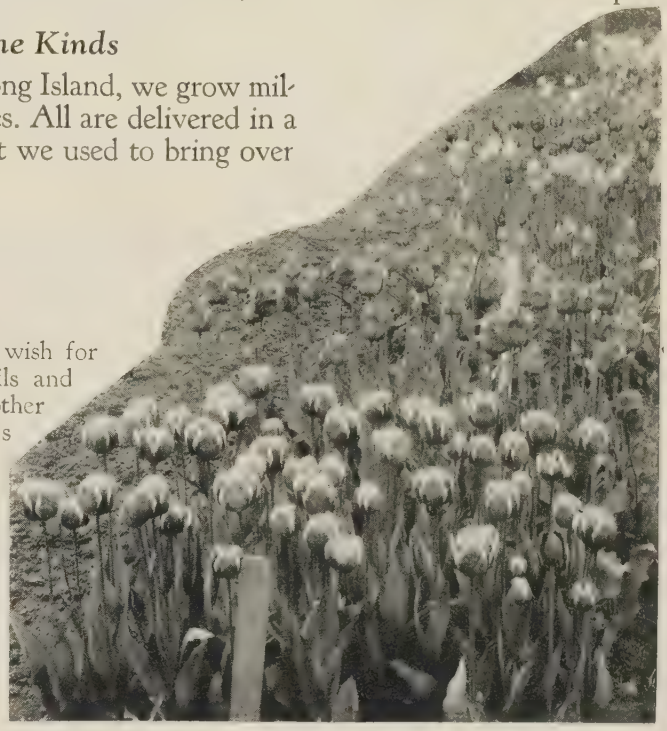

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Horticultural Congress

The International Horticultural Congress, which takes place in London during the summer of 1930, offers to those attending it the opportunity to see Europe and England at a very reasonable cost and from a new viewpoint. The Canadian Horticultural Council, whose offices are in Ottawa, Canada, and with whom reservations may be placed, announce that a fourteen-day hegira over the British Isles will be followed by a trip to Belgium, Holland, Germany, Switzerland, and France, from which sailing will be booked for Montreal. The minimum expense, with, of course, the exceptions of tips and baggage, is listed at $575. Non-horticulturally-minded individuals are included in the invitation.

Roadside Stands

The Massachusetts Committee of Better Homes in America, with Mrs. James J. Storrow, president, is now conducting a campaign to bring Outdoor Good Manners on the part of the Bay State standowners through a contest in which wayside stands will be graded and marked and the least offensive of them awarded prizes. Each standowner in the state is eligible. Judging will be done partly from photographs and plans, partly from personal visits by members of the staff and local committees. It is to be hoped that all owners participate, so they may see the truth of the principle that the best looking get the business, besides keeping the beauty of Massachusetts roads.

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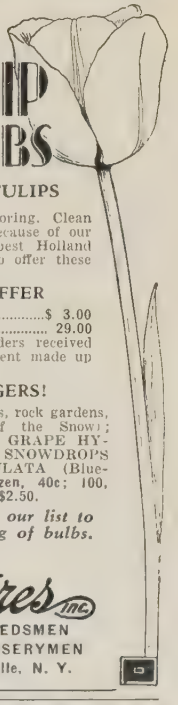

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ity increased and finally became so great that the equatorial portion could no longer be retained by gravity and was detached from the rotating mass in the form of a ring. This ring then became unstable and broke up and the material of which it was composed collected in the form of a planet. By successive repetitions of this process eight planets were formed and in a similar manner satellites were also formed from the planets. An extremely simple and satisfying theory it was, destined to be received with favor for many years to come and then to be abandoned reluctantly. According to his biographers LaPlace's initial distrust of his theory was gradually replaced by a feeling of complacent interest in his own creation. For years no criticism of the theory was heard. Few theories have met with such universal favor.

Toward the end of the nineteenth century the nebular hypothesis began to get involved in considerable difficulties. Two small satellites of Mars, Deimos and Phobos, were discovered and the inner of the two satellites, Phobos, proved to be a most peculiar little object. It was found that it was making more than three revolutions around the planet Mars, while Mars was turning once on its axis! Such a state of affairs was inadmissible according to the nebular hypothesis which assumed that the planet threw off its satellites originally in the form of rings which of course could not revolve more rapidly than the planet was rotating. The mathematician Poincaré tried to extricate the nebular hypothesis from its difficulty by the rather far-fetched explanation that solar tides had greatly slowed down the rotation of Mars after the little satellite had been formed. But then, as Moulton later pointed out, it had been discovered that the inner particles of Saturn's rings were revolving in only one-half the period of Saturn's rotation and in this case tidal friction was too slight to have any appreciable effect on the planet's rotation period.

Again, according to the nebular hypothesis, all planets and all satellites should revolve in the west-to-east, or counter-clockwise, direction in which the original nebula was rotating. But a ninth satellite of Saturn named Phoebe was discovered, which also caused trouble for the theory because it was found to be revolving around Saturn in retrograde direction. Later two satellites of Jupiter were discovered which were also revolving in the east-to-west direction and this did not make the outlook any brighter for the nebular hypothesis.

As an additional serious objection it was shown by the astronomer Kirkwood in the later part of the nineteenth century that if any unstable condition should set in in the equatorial zone of the rotating nebula, such as was assumed to result in the detachment of a ring, it would persist continuously. In other words it would be impossible for rings to be detached except at certain intervals. Moreover, if a ring should form, it could never condense into a planet because expansion of the gases of which it was composed and tidal attraction of the solar nebula would overbalance the gravitation of its parts.

A most serious objection to the LaPlacian theory pointed out by Prof. F. R. Moulton lay in the fact that it was possible to calculate what the speed of rotation of the solar nebula would be when it extended to the distance of any one planet and the calculation showed that the speed of rotation must have been far too small to result in the detachment of any rings.

In addition the nebular hypothesis could not explain the existence of the asteroids with their intertwining orbits and high inclinations. It would not tolerate the existence of such an object as the planetoid Eros which extends in a greatly elongated orbit from a point near the earth to beyond the orbit of Mars. It would have difficulty explaining also the high inclination and eccentricity of the orbit of Mercury. Finally, it assumes that the outer planets are much older than the inner planets while as a matter of fact the inner planets appear to be fully as old as the outer ones.

IN THIS and the two or three following articles, Mrs. Lewis will tell of the struggle science has made and is making to explain the greatest of all mysteries—how the stars and the solar systems—particularly our solar system —have been evolved. Theory after theory has been discarded; the beliefs of centuries have been overthrown by some slight observation. Like characters in a mighty drama these old hypotheses stalk across the stage under Mrs. Lewis' pen, each revealing a new picture of what the past might have been. Do not miss this series of articles. They will be worth preserving.

The contraction theory of the sun's heat which was developed by Helmholtz in 1854 was looked upon as favorable to the nebular hypothesis. It showed that as the solar nebula contracted it would become hotter so long as it remained in a gaseous state, as it is at present. Since its mass, volume and rate of radiation are known, it could be shown, according to Helmholtz theory, that a contraction in the radius of the sun of only 120 feet in a year, an amount that could not be detected with the most powerful telescopes for some thousands of years, would be sufficient to supply as much heat as it is now radiating. When the sun ceased to behave as a perfect gas it would begin to lose heat more rapidly than it gained it. Its rate of radiation would decrease, its temperature and therefore that of its planets would begin to fail and eventually a cold and invisible sun would speed through space attended by a family of lifeless planets. The great weakness of the contraction theory as the sole source of the sun's heat lay in the fact that it gave far too short an interval of time for all the vast geological changes that are known to have taken place upon the earth. According to the contraction theory the earth could have received heat from the sun at its present rate for only about twenty-five million years. From many other sources it is known that the age of the earth is at least one hundred times as great as this.

It is now very evident that contraction of the solar nebula cannot be regarded as the only source of solar heat or even of a very considerable portion of it. Fortunately the discovery that a tremendous amount of energy is locked up in the atom and is continuously being released in the transmutation of elements within the sun itself has made it unnecessary to draw upon

(Continued on page 416)

Helps and Hints

FOR HOME AND GARDEN

June is the month in which your money invested in plants and your sore muscles invested in labor begin to draw interest. The gladioli spikes become brilliantly uniformed soldiers, the peonies burst forth to the tune of summer breezes, the sweet peas, lilies, irises and hundreds of others of your blooms begin their annual color riot. But besides sitting down beside them all and watching them change, there are things to do. There is no rest for the gardener, or the wicked.

* * *

For instance, geranium cuttings are taken this month, for next winter flowering, Regal lilies can now be grown from seed, being first planted in boxes, delphiniums are sent outside in seed boxes with cheese-cloth nettings around them to keep away slugs, columbine for next year's crop of flowers are sown. June is the period for budding, the usual method for propagating roses. Fruit trees may be propagated in this manner, but earlier in the season. Sweet peas, tomatoes, dahlias should be deprived of their side laterals in order to develop larger flowers or fruit. Pinch back relentlessly if you prefer quality to quantity.

* * *

Keep the earth around your plants well stirred up during the hot months, both to prevent caking and evaporation and to allow proper absorption of water. Sweet peas may be mulched with grass clippings. Any shrubs that in order to fit into your garden plans must be kept compact or dwarfed should be root-pruned by cutting off the small roots reaching out beyond the spread of the branches.

* * *

Tie up hollyhocks, dahlias, delphiniums and other tall-stemmed plants to guard against sudden wind-storms and hail-storms. If you are working for a continuous bloom thoughout the summer of gladioli, the last of the bulbs should be planted about the middle of the month, five or six inches deep and about four inches apart. They will bloom in approximately ninety days.

* * *

During the month, when the road-builders are in their glory, is the chance to bring home wild-flowers from their excavations, in the manner described by Mrs. Frances E. Whitley in this issue. But don't pull them out by the roots from localities where they would not necessarily be destroyed this summer! And obtain advice, either from our garden department or some other source, on the right kinds of soil, light and surroundings for them. Bring in plenty of the soil in which they are growing.

* * *

Relative to the pruning of rambler roses, which may be done now, a Helpful Hint is handed in by Charles F. Krieg of Columbus, Ohio. He advises cutting the old branches clean through close to the ground and

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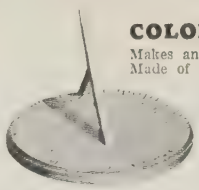

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leaving them there until withered and dead; they then can be distinguished from the others entangled in the mass, cut into three or four foot lengths, and pulled out with less danger from the thorns.

* * *

Miss Emily R. Sugden of Windsor, Conn., is responsible for several valuable suggestions. Seeds culled from the side stems of flowering stalk seldom develop when sown; the central stalk of blossoms are more prolific, and the side stems may well be removed to let all plant strength concentrate on the center development. Regarding maiden-hair ferns, she advises keeping them out of a draft, which may be done by placing the pot in a jardiniere large enough to have an air space all around it. This also conserves moisture. The earth should be watered well once a week, and the whole plant sprinkled with lukewarm water twice a week.

* * *

Alexander Laurie's article of advice on insect pests may well be taken to heart. While you may name, and mix, your own poisons, yet there are so many valuable and reasonably-priced insecticides on the market that the busy gardener may prefer to devote his time to other things. Some of the best preparations are listed in our advertising columns.

* * *

About the first of June, divide and set out dahlia tubers, planting them five or six inches deep, in well-drained, fairly rich soil. Be sure to allow plenty of room between the plants so that they may have air and light.

* * *

One of the features that should be added to your garden this year, especially if you are a New Englander, is a rock garden. Any section of the estate or lot can be utilized, preferably one where varying light and heat conditions obtain, where there is a group of trees, or a wall or building to give shade part of the day. No other garden device can so reflect your personality and taste as this. The usual procedure is to dig down about two feet, or less if the drainage is unusually good, place a layer of stone and gravel for drainage, then add prepared soil, consisting of varying parts of sand, stone chips, loam, peatmoss, leafmold, and other ingredients, depending upon whether an acid, sweet, dry or moist soil is wanted. The rocks are placed on top; granite is very acceptable, as is sandstone if not too crumbly; two or three big boulders should be added for effect. Remember that rocks collect moisture, and aid plant growth. Different types of gardens may be the mound type, built up from the surface; the wall variety; the terrace; the sunken garden, or the watered rock garden, that is built either close to a little stream, or arranged with a buried faucet that drips moisture from the upper edge to trickle downwards, and furnish moisture for water-loving plants.

* * *

Give your roses water only every two or three days during the summer months but when you water them give them a very thorough soaking. Of course, drainage must be good, for having "wet feet" is harmful.

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Edward H. Forbush Passes

Edward Howe Forbush was born in Quincy, Mass., April 24, 1858, and died in Westboro, Mass., March 8, 1929. Many men live through seventy years, but seldom can we say with so much truth that such a life was spent in the service of his fellows. He came from a long line of sturdy New England ancestry. Most of his life was spent in eastern Massachusetts, and the call of the sea and the woods, which came to him early, was always in his ears. In his youth he made trips to Florida and the central and western Canadian Provinces, and many shorter excursions to varied fields in later life increased his breadth of experience.

A notable service of his earlier years was his leadership in the educational work of the Worcester Natural History Society; one of whose main activities was the establishment of a summer camp, specializing in Nature study. Mr. Forbush was the leader of this camp for several years and was thus a pioneer in a field that is now recognized as of prime importance. For several years he made special studies in ecology and the conservation of bird life at Concord. Later he directed the work of keeping in check the gypsy moth, but finally resigned, discouraged by the lack of sufficient financial support. At the time of his retirement from active public service in April, 1928, he had served nearly twenty years as state ornithologist of Massachusetts. It was here that he published his more notable earlier works, two extensive volumes on the protection of our birds, and numerous shorter reports. He will be best known for his great work on the *Birds of Massachusetts and other New England States*. Two of the three volumes have been issued, and the remaining one will be awaited with impatience. Someone has said that his last piece of writing was the account of his beloved bluebird.

Mr. Forbush was a Fellow of the American Ornithologists' Union and served for many years as New England representative of the National Association of Audubon Societies, and as a member of the Advisory Board under the Migratory Bird Law and the Treaty Act. Here his influence was ever thrown in favor of the living bird, in accordance with his avowed principle: "That life, not death, would solve all riddles; that an examination of the dead was merely a preliminary to the study of the living, and that it was more essential to preserve the living than the dead."

For long, wherever men and women meet in the interest of bird life, his genial and helpful presence will be missed.

E. A. P.

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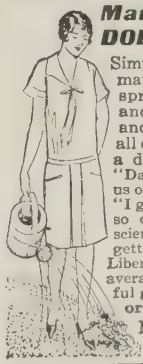

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Scouts at Work

While the mention of the specific activities of the hundreds of Boys and Girl Scouts and Camp Fire Girls in connection with the National Flower campaign would require a special edition of Nature Magazine, yet the work of the Chattahoochee Council of Boy Scouts in Georgia and the Orange Girl Scouts in New Jersey deserve attention. The Boy Scouts, under the leadership of H. G. Bradshaw, held elections throughout schools and clubs under the same rules as those governing county elections. They were highly praised by the heads of the organizations for their thoroughness and accuracy. The Girl Scouts of the Oranges are conducting a "100%" campaign, in which each scout is to vote, and a special drive is being made to enlist the parents. With such enthusiasm and intelligent leadership as these examples show, the poll will have important citizenship-training value and great educational worth.

Outboard Motors

The "putt-putt" of outboard motors will soon resound over lake and river, and each "putt-putt" will reflect in some manner the valiant efforts of the National Outboard Association, a growing concern, to improve conditions for the water-motoring public. The association has just been organized under the leadership of its National Commodore, Commander Eugene F. Macdonald of Chicago, and is dedicated to providing national service to small boat owners, advocating favorable legislation, promoting outboard racing, and developing and controlling of water highways. Everyone with a canoe, rowboat, catboat or dugout, motor-equipped, will wish to join up.

Inaugural Visitors

Just before the masses of marching men streamed up Pennsylvania Avenue under the driving rain that ushered in Mr. Hoover's presidency, and while the silver-gray dirigibles had not yet taken their place in the air procession, the hundreds of thousands of watchers were treated by another air parade. The participants, not on the program, were two flocks of wild geese which swept through the flying wisps of fog with never a deviation. Strange enough, they were flying south at the time, and Miss Ida Curry of New York, who reported the incident, asks, "Were they circling to see the sights?". In olden days, the appearance of the geese would be deemed a good omen. We hope that these ancient superstitions will be justified during the next four years.

National Bird Day

A National Bird Day, which shall come in May, and which shall be dedicated to appreciation of the feathered creatures of song and insect-eating propensities, has been suggested by Capt. Hugh Voorhies, lecturer and writer, and the American Nature Association will gladly second the motion. Capt. Voorhies says, "There are no creatures more important and essential than the birds—what a dreary old world this would be without them!" Every dog has his day—why not a national one for the singers of springtime?

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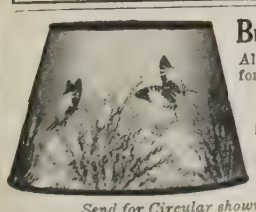

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Dr. Robert Ridgway

The death of Robert Ridgway, ornithologist and author, has widened the void in the important field which has already lost Louis Agassiz Fuertes, William Leon Dawson and Edward Howe Forbush. For many years curator of the Division of Birds of the United States National Museum at Washington, the founder of the American Ornithologists' Union, a co-author of a standard work, *The History of North American Birds,* and a member of various international congresses for the study of bird life, he was a leader in his profession. His Washington friends will miss him most, perhaps, but all Nature lovers everywhere will deeply regret his passing.

Prizes for Essays

Two prizes, one of $1000 and the other of $250, have been made available by a friend of forestry for award by the Society of American Foresters, Lenox Building, Washington, D. C., for the two best essays of not more than three thousand words describing the present forestry situation in the United States and proposing a nation-wide remedy for its solution. The contest is open to all, but essays must be submitted under a pseudonym with the author's real name in a sealed envelope. The essays should be sent either to S. T. Dana, School of Forestry and Conservation, University of Michigan, Ann Arbor, Michigan, or Raphael Zon, Lake States Forest Experiment Station, University Farm, St. Paul, Minnesota, to reach them before September 30, 1929.

Burroughs Honored

The eighth annual celebration of Conservation Week of the New York State and City Federations of Women's Clubs took place the first week in April. The chief feature was the observation of the birthday of John Burroughs in a meeting in New York City. It is estimated that over 2,000 took part in the program. Different organizations reported on progress during the year, the national park situation was discussed after leaders had outlined present day conditions, and plans for another year evolved. One of the prominent leaders in this honor to Burroughs was Mrs. C. C. Marshall, the president of the National Life Conservation Society, who, as chairman of the Federation Committee on Forestry, Natural Scenery, Highway and Memorial Tree-planting, has been very active both in national park conservation and in supporting all conservation measures. One of the speakers was Miss Frances Ann Johnson of Littleton, N. H., the winner of the prize for the best poem on Yosemite National Park.

For Camp Counselors

The University of Iowa Conference for Camp Counselors opens at Iowa City under the direction of Miss Marjorie Camp, assistant professor of Physical Education at the University, for its two-week period on June 8. Courses in canoeing, swimming, camp craft, camp organization, physical education, and Nature study are offered and university credit is given. The Department of Physical Education for Women is now receiving applications.

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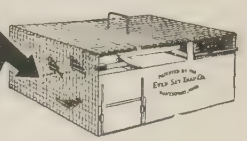

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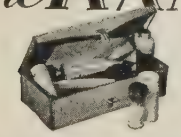

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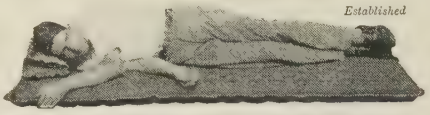

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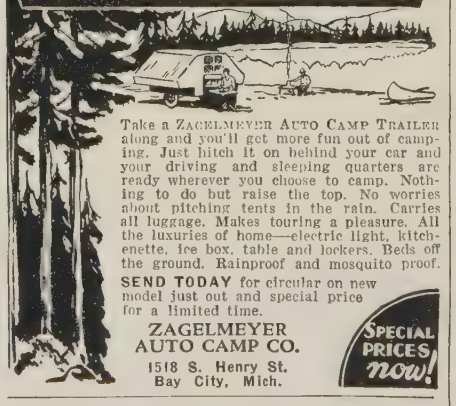

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THE NEBULAR HYPOTHESIS

(Continued from page 406)

the contraction theory for an explanation of the source of the light and heat that the sun is so extravagantly pouring forth into space. Subatomic energy alone is sufficient to keep up the present rate of solar radiation for thousands of millions of years.

In spite of all the serious and fundamental objections that have been raised against the nebular hypothesis there are many who are slow to abandon it even today. Yet it is undoubtedly doomed to be entirely discarded before long in favor of modern theories against which fewer objections can be raised. The most noted of these theories and the one which has greatest weight with astronomers at the present time is The Planetesimal Theory of Chamberlin and Moulton which we will consider in our next article.

Two planets will be found in the evening sky this month. Mars is now in The Sickle in Leo, a little to the northwest of Regulus. The ruddy planet has greatly decreased in brightness since last winter and is now not much brighter than a second magnitude star. It is noticeably inferior to Regulus in brightness. Saturn is in Sagittarius and will be in opposition to the sun on June 19. It will then rise at sunset and will be visible all night.

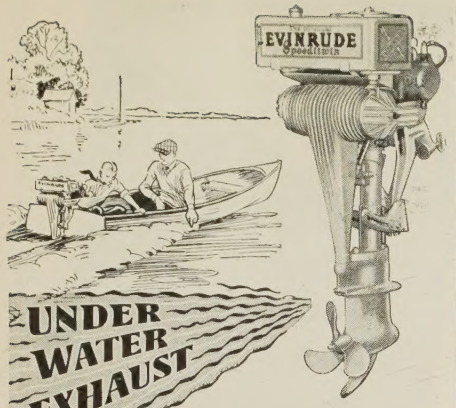
Venus is now a brilliant morning star rising about two and a half hours before the sun. It will be at greatest western elongation or its greatest distance west of the sun on June 29. Jupiter will be too close to the sun to be seen the first part of the month. It will rise about one and a half hours before the sun in the constellation of Taurus on June 15. Mercury will not be favorably placed for observation in June as it will be in inferior conjunction with the sun on June 9.

Summer will begin on June 21 at 5:01 p.m. Eastern Time when the sun will reach its highest northern declination in the constellation of Gemini.

Although summer constellations are not as brilliant as those of winter many beautiful and interesting objects will be found in the evening sky this month. Coma Berenices is composed of a coarse cluster of fifth and sixth magnitude stars that gives the impression of a filmy veil or cloud of stars to the naked eye but is easily resolved into a multitude of faint stars with the aid of a field glass.

In Hercules on a dark, moonless night, one can faintly glimpse without telescopic aid a faint patch of light on the western side of the quadrilateral that outlines the giant's body, in the position shown on the chart. This is the great Hercules Cluster, a universe composed of hundreds of thousands of suns, at a distance of thirty-six thousand light years from the earth.

Arcturus and Vega, the two finest stars of the summer evening skies, are now prominently in view. Although almost exactly equal in apparent brightness these two stars differ strikingly in color. Both are comparatively near neighbors of the solar system. Arcturus is less than thirty light years distant and Vega about forty. Vega also is an extremely hot sun while Arcturus is comparatively cool with a temperature of about 40,000 degrees Centigrade.



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Federation Conservation

One of the active groups of the Conservation Department of the General Federation of Woman's Clubs has been the Division of Birds, Game and Flowers, whose chairman is Mrs. Katherine B. Tippetts, of St. Petersburg, Florida. Besides furnishing information on game and flower conservation laws, state flowers, sanctuaries, national bird and game reservations and conservation societies, Mrs. Tippetts has sent out questionnaires to determine the conservation needs of each state, actively supported state bird campaigns, arranged programs for education, and published bibliographies for Nature study. Together with the American Nature Association and other organizations, the Federation has jointly undertaken to develop courses in Nature study and natural history in all grade school curricula. At present, Mrs. Tippetts is cooperating on the National Flower campaign.

Allegany Summer School

The Allegany State Park Summer School, an outdoor training school of Natural History, will open its third season on July 5 on the new lake made by damming Quaker Run, in the heart of the park and seventy miles from Buffalo, New York. The school is designed to instruct, through contact with Nature and under the leadership of expert teachers, both men and women who desire to be better qualified as natural history teachers. Unusual opportunities for study can be obtained within the 60,000 acre park and the adjoining Allegheny National Forest. The director, Robert E. Coker, of the University of North Carolina, can be reached at Box 950, Chapel Hill, North Carolina, until June 15.

Observation of a Moon-bow

A correspondent, Stafford C. Edwards of Colton, California, describes briefly a moon-bow seen during the summer of 1928 on a mesa in Arizona, near the famous prehistoric cliff-dwellings called Montezuma Castle. A heavy thunder storm that threatened had passed, and the violent wind had suddenly ceased. "A nearly full moon shone in the cleared sky of the east, and against the black raincloud that had passed westward appeared a beautiful rainbow. Several of the colors were easily distinguished, as in a rainbow caused by sunlight." Moonbows are probably less rare than we think, but conditions favorable for their formation and observation are naturally less often present than in the case of the more popular sunlight rainbow.

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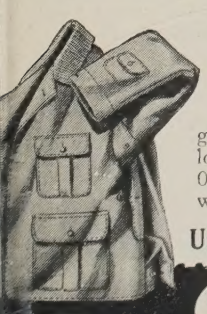

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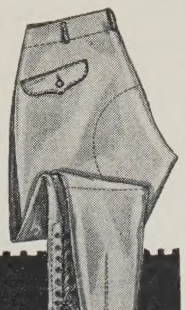

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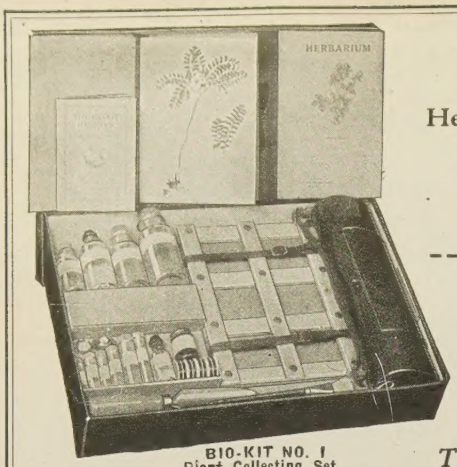

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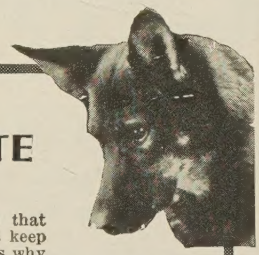

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A little book of unusual interest is *An Introduction to the Birds of Pennsylvania* by George Miksch Sutton, state ornithologist and well known as author and artist. The aim of the author has been to furnish an up-to-date understandable book, simple in treatment and low in price, and he has succeeded. There are introductory paragraphs on observing and recording, equipment for bird walks, economic value of birds, life zones, and migration. Practically every species of bird now living within the state is briefly described and most are represented by a line drawing. A unique suggestion is that the figures may be colored by the student in crayon or water-color, and the paper is suitable. Identification is assisted by good descriptions, and other pertinent data are given on ranges, nesting, eggs, and general habits. The book is published by the J. Horace McFarland Company, Harrisburg, Pa., and costs one dollar.

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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

The American Tree Association

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RUSSELL T. EDWARDS
Educational Director

Ambassador of Japan Joins Tree Army

Certificate of membership in American Tree Association presented to Mr. Katsuji Debuchi at University of Missouri

With the planting of a Japanese Cherry tree on the University of Missouri campus at Columbia, Mr. Katsuji Debuchi, Ambassador extraordinary and plenipotentiary of Japan to the United States, has joined the ranks of the tree-planting army. The certificate of membership in the American Tree Association was presented to the Ambassador by Walter Williams, dean of the School of Journalism. By the planting the Ambassador joins the ranks in which are found the names of the Prince of Wales, Mrs. Calvin Coolidge, Mrs. Warren G. Harding and thousands of others whose planting is registered on the national honor roll of the American Tree Association. Mrs. Coolidge planted the Oberlin College Elm on the grounds of the Lincoln Memorial. Mrs. Harding planted two trees at the head of one of the avenues leading to the memorial to mark the date of the Limitation of Arms Conference called by President Harding.

Tree planters everywhere are enrolling in the association's membership. One of the first to report was the Mercer County Parents and Teachers Association of New Jersey. Each member association of the council delegated its president to plant along a road leading out of Trenton. Mrs. F. R. Pidcock and William S. Borden of the Mercer County Shade Tree Commission made the arrangements. The following planted the trees: Mrs. Samuel Willizol, Mrs. James Ballentine, Mrs. Charles Cochran, Mrs. John Kessler, Mrs. Marvin Howell, Mrs. R. W. McIlhenny, Mrs. H. V. Parry, Mrs. Walter Swell, Mrs. Paul Tector, Mrs. George L. Parsons, Mrs. T. Russell Allen, Mrs. F. Miller, Mrs. Harvey Satterthwaite, Mrs. J. J. Weisgerber, Mrs. Ray Tomlinson, Mrs. L. V. Sylvester, Mrs. J. J. Johnston, Mrs. H. B. Skellinger, Mrs. L. W. Biallas, Mrs. W. E. Reed, Mrs. Samuel Finley, Mrs. Edmund Allen, Mrs. I. B. Hunter and Miss Margaret Phillips.

One hundred and thirty schools of Bronx County, New York City, took part in the ceremonies inaugurating the George Washington Four-Year Tree-Planting Campaign at Poe Park, Fordham, on the anniversary of the battles of Concord and Lexington. A seedling from the New York State Nursery, at historic Saratoga, was transplanted near the Washington oak, in the park. Alexander McDonald, State Conservation Commissioner through the division of Lands and Forests, of which William G. Howard is superintendent, provided a demonstration in applied forestry, as the chief feature of the exercises. The purpose of the enterprise is to "dress up" for the George Washington Bi-Centenary in 1932, particularly on the part of urban dwellers. The ceremonies were under the auspices of the Park and Forestry Association of Bronx County and the American Memorial Parkway Federation.

An example of the way the forestry message is spreading is shown by the Scouts of Troop 20 of Tremont, Miss., who have extinguished nine forest fires during the past few months. It is estimated that the boys have prevented 25,000 acres of forest land being burned over. "The Scouts of Troop 20 have been taught to love the forest and to lend a hand whenever possible in protecting them," says L. M. Rayburn, Superintendent of the Consolidated High School, Scoutmaster of Troop 20 which is one of the most progressive Rural Troops in the South. The scouts in all parts of the country are keen for tree planting. Dana C. Wrightington of Lexington, Mass., reports that Troop 22 is planting trees at their camp. Trees make better Scouts he says in applying for membership in the tree-planting army. More than 3,000 trees were planted by the Boy Scouts of the Navajo Mountain Council at Altus, Okla., when 150 scouts took part in the work.

Roadside beautification enters into the tree-planting program in thousands of places. At Higginsville, Mo., for example, native flowers and trees are to be brought back to the roadsides. The first work will be done along Transcontinental Highway No. 40, which crosses Missouri from St. Louis to Kansas City. The plan grows from initiative of the Missouri State Highway Commission in offering aid in roadside improvement. Assistance in beautifying farm homes and surroundings along the roads also has been offered by the Missouri agricultural extension department. Removal of signs, billboards, and unsightly fences will be the first effort of the movement.

A tree-planting program aroused much interest at the Van Nuys, Calif., Elementary school when the young people were called together by their principal, Oletha Stearns, at a planting ceremony for the black walnut tree which was given the school by Superintendent J. B. Monlux. He gave to each school a tree to plant on their campus. Members of the Kiwanis Club at Barstow, Calif., assisted in the planting of trees on the grammar school grounds. The tree planting was in charge of George Henderson and Frank Butts of the Kiwanis Club. The Club is sponsoring the planting of trees on the school grounds and prizes will be offered to the class taking the best care of the trees. Sixteen trees in memory of soldiers and two other trees for war mothers were planted by the Fresno Chapter of the American War Mothers, led by Mrs. Virginia Lee Staniford. Arbor Day at Long Beach was observed by the planting of trees and shrubs by the Parents-Teachers Association at the Roosevelt School.

One of the biggest educational tree-planting programs is under way in Nebraska. Through the State Department of Education the American Tree Association is sending the Forestry Primer and the Tree Planting Book to every teacher in the State. It is expected that thousands of trees will be planted in the home state of J. Sterling Morton, the father of Arbor Day. Gov. A. J. Weaver issued a proclamation on the tree planting just before the distribution by the American Tree Association.

TREES FOR WASHINGTON

Plans are now under way for marking the two-hundredth birthday of George Washington in 1932. There is to be a memorial highway from the Capitol to Mt. Vernon which of course will be beautified and the states of the Union should have a part in planting the memorial trees that will line the highway. George Washington memorial trees will be planted in thousands of places and they should all be reported to the American Tree Association. News dispatches from Nanking tell how the planting of trees featured the observance in honor of Dr. Sun Yat-Sen, first provisional president of China. Nationalists call him the George Washington of their country. The year 1932 is not far away and it may be well to make plans at once. The American Tree Association will be glad to send any committee tree-planting suggestions and a tree-planting program.

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